Customer Information Utilization as a Part of Telecom Operator's Customer Relationship Management

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ABSTRACT OF THE
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Telecom operators gather a considerable amount of data daily through various customer touchpoints. Data collection is required by the law; in addition, it is a useful method to understand customers' needs and to maintain competitive advantage. However, customer information must be efficiently utilized and supported by a functioning Customer Relationship Management (CRM).

Traditionally, CRM has only been understood in terms of a technical solution, but the attention has been paid recently to CRM as a customer-centered strategy. Therefore, this thesis aims to identify development suggestions to improve the efficiency of CRM, with particular focus on the customer information utilization and business performance of telecom operators, as well as customer experience and engagement. In order to evaluate the current state of CRM practices and customer information utilization in the case company, this thesis is conducted as a qualitative study in a Finnish telecom operator. The research consists of a literature review and an empirical part, which includes six semi-structured interviews with the representatives of the case company and a document analysis.

Based on the literature review, CRM is a customer-oriented strategy which ideally increases profitability, efficiency, and customer satisfaction. CRM strategy development should be understood as an organization-wide change process. The efficiency of CRM can be improved by centralized technology solutions, which increase the information accuracy and enable complete customer profiles. Data governance requires a specific definition of data standards and responsibilities, as well as an insurance of the data quality by a continuous repair process. The business processes must be designed in a customer-oriented way with customer information being defined in each process. Companies with a wide customer base should ideally employ a customer manager, who is responsible for the customer lifecycle process.

The most important development areas identified for customer information utilization were increasing customer insight in the customer service channels, process development, marketing, digital personalization, and data commercialization. Big data analytics allow utilization of multiple data sources and better business decisions. The challenges of customer information utilization consist of both internal and external factors. Internal challenges relate to problems in the data quality caused by the information systems and business processes. The external challenges are the limitations imposed by the law, as well as the challenges in obtaining consents from the customers for information utilization. Anonymization allows a more versatile customer information utilization. However, it is important to balance the benefits of customer information usage and retention of the customer privacy. This thesis recommends that the case company should diversify its customer information utilization to achieve better business benefits.

Keywords: CRM, big data, semi-structured interview, privacy

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Teleoperaattorit keräävät päivittäin huomattavasti informaatiota useiden asiakaskohtaamisten kautta. Tietoa kerätään lain velvoittamana, mutta myös asiakkaiden tarpeiden ymmärtämiseksi ja kilpailuaseman säilyttämiseksi. Asiakastiedon tehokas hyödyntäminen vaatii kuitenkin taustalleen toimivan asiakkuudenhallinnan.

Asiakkuudenhallinta tulee ymmärtää pelkän teknologisen ratkaisun sijasta asiakaskeskeisenä strategiana. Tämä diplomityö pyrkii tarjoamaan toimenpidesuosituksia asiakkuudenhallinnan kehittämiseksi, huomioiden erityisesti asiakastiedon hyödyntämisen mahdollisuudet liiketoiminnan tehostamiseksi ja asiakaskokemuksen parantamiseksi. Diplomityö on toteutettu laadullisena tutkimuksena suomalaiselle teleoperaattorille tarkoituksena selvittää asiakkuudenhallinnan ja asiakastiedon hyödyntämisen nykytilanne kohdeyrityksessä. Työ koostuu kirjallisuuskatsauksesta sekä empiirisestä osiosta tutkimusmetodeina kuusi puolistrukturoitua haastattelua kohdeyrityksen edustajien kanssa sekä asiakirja-analyysi.

Kirjallisuuskatsauksen perusteella asiakkuudenhallinta voidaan tiivistää asiakaslähtöiseksi strategiaksi, joka onnistuneena lisää yrityksen tuottavuutta, tehokkuutta ja asiakastyytyväisyyttä. Asiakkuudenhallinnan kehittäminen tulee ymmärtää koko organisaation laajuisena muutosprosessina. Asiakkuudenhallinnan tehokkuutta voidaan lisätä keskitetyllä teknologiaratkaisulla, joka pitää yllä tiedon oikeellisuutta sekä mahdollistaa kokonaiskuvan asiakkaasta. Tiedonhallinta vaatii datan standardien ja vastuualueiden määrittelyn sekä datan laadun varmistamisen jatkuvan korjausprosessin avulla. Liiketoimintaprosessit on suunniteltava asiakaslähtöisesti ja asiakastiedon merkitys eri prosesseissa tulee määritellä. Laajan asiakaskunnan omaavilla yrityksillä tulisi olla asiakkuusjohtaja, jonka vastuulla on asiakkaan elinkaaren prosessi.

Tärkeimmiksi asiakastiedon hyödyntämisen kehityskohteiksi tunnistettiin asiakasymmärryksen kasvattaminen asiakaspalvelukanavissa, prosessikehitys, markkinointi, digitaalinen personointi ja tiedon kaupallistaminen. Big data -analyysit mahdollistavat useiden datalähteiden hyödyntämisen ja parempien liiketoimintapäätösten tekemisen. Haasteet asiakastiedon hyödyntämisessä johtuvat sekä sisäisistä että ulkoisista tekijöistä. Sisäisiä haasteita ovat tietojärjestelmien ja prosessien aiheuttamat ongelmat datan laadussa. Ulkoisia haasteita ovat lainsäädännön asettamat rajoitukset sekä tiedon hyödyntämisen lupien kerääminen asiakkailta. Anonymisoinnin avulla asiakastietoa on mahdollista hyödyntää monipuolisesti. On kuitenkin tärkeää tasapainottaa asiakastiedon käyttämisen hyödyt ja asiakkaan yksityisyyden säilyttäminen. Tämä diplomityö kehottaa kohdeyritystä monipuolistamaan asiakastiedon hyödyntämiskohteita liiketoiminnan tehostamiseksi.

Avainsanat: asiakkuudenhallinta, asiakastieto, big data, puolistrukturoitu haastattelu, yksityisyyden suoja

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Helsinki, 16.6.2015

Viivi Jäppinen

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Abbreviations

ARPA	Average Revenue Per Account
ARPU	Average Revenue Per User
B2C	Business-to-Consumer
CEC	Customer Engagement Center
CEM	Customer Experience Management
CLV	Customer Lifetime Value
CRM	Customer Relationship Management
EDW	Enterprise Data Warehouse
ERP	Enterprise Resource Planning
IT	Information Technology
NPS	Net Promoter Score
P2P	Peer-to-Peer
PET	Process Excellence Team
SCRM	Social Customer Relationship Management
VoC	Voice of the Customer

1 Introduction

1.1 Motivation and Background

Almost everyone in the industrialized world owns at least one mobile device such as cell phone, smartphone, or tablet. These mobile devices produce time and location-specific data including contextual information generated in the social networks. Vast amounts of data are collected by telecom operators from the services they provide for their customers. This information includes network data, basic customer information, and billing data. However, a common challenge with the operators is to know how to efficiently use all this collected information.

Customer data can be better utilized through big data since it can be analyzed to reach the customers' expectations. Predictive analyses are made from big data to target customers in order to better identify the customer needs. These analyses are then used, for instance, for marketing purposes and for increasing the customer satisfaction. There is more data available than ever before in different channels, and marketers must balance how to improve the customer experience without, however, disturbing a customer's privacy.

Effective data utilization requires a functioning Customer Relationship Management (CRM) strategy in the company. Consumers have become more value-conscious, which has contributed to companies changing their business strategies from product-based to customer-based. Improvements in data storage technology and development of CRM systems have enabled companies to get closer to their customers. Instead of just completing the transaction with the customers, companies have started to develop long-term relationships with them. The changing trends from mass-level customer acquisition to one-to-one acquisition indicate that today's companies rather keep the existing customers and win back lost ones than continuously increase the customer base. The need to better understand and engage the customers receives special attention.

To benefit from the CRM system as much as possible, its strategy implementation should be understood as an organization-wide development process. In addition to the technical integration, changes in the organizational culture and process and people should be taken into consideration.

1.2 Research Questions and Goals

This research is conducted in a Finnish telecom operator and considers the utilization of customer information and management of consumer customer relationships in the company. The starting point is that the case company is concerned about their CRM strategy not being organization-wide. Customer information is processed across the organization in different processes and systems. It is clear that some activities should be repaired in order to enable for the CRM a permanent state in the company as well as to provide a better 360-degree view of the customer. The thesis examines the biggest pitfalls that cause information flow problems in the processes and aims to provide suggestions to improve the CRM operation. An effective CRM strategy can also provide new sources of information utilization.

This thesis seeks answers to the following two questions:

Q1. What does an efficient customer relationship management require from a company? The study pursues to define CRM, its contents and benefits. The study aims at establishing the current state of CRM in the case company. The goal is to identify the similarity between the current state and the introduced conceptual framework in the literature review. In case the CRM process was not operated successfully in the company, the research will suggest improvement ideas for an effective CRM strategy.

Q2. How could customer information be utilized to obtain better business benefits? The research introduces the ways customer information is currently utilized in the company. The aim is to find possible utilization cases for customer information and evaluate how better utilization would affect the business performance. This study will also examine how information security and legislation need to be considered when processing customer information.

The desired outcome of the study is that also other companies with a wide customer database could benefit from the findings and apply the suggested ideas in their businesses.

1.3 Research Method

This thesis was conducted as a qualitative study, using literature review and empirical research as the research methods. The literature review is implemented to understand the conceptual framework and find case examples of the CRM and information utilization. The purpose of the literature review is to construct an overview of the CRM

and information utilization, as well as explain the main concepts related to those. The empirical research examines the current state of the CRM and information utilization in the company. The analysis methods for the empirical research include interviews and a document analysis.

The qualitative and semi-structured interviews are conducted to gather information about the current situation of the CRM and information utilization and to collect ideas for development purposes. Six representatives from the company with different perspectives for CRM were chosen for the interviews. Additional data such as information about the processes and Information Technology (IT) system is collected from the company documents and records.

The interviews were analyzed with the meaning condensation method. In this method few categories are identified from the transcribed interviews, and the interviewees' statements are summarized under these categories. The recurring themes are then easier to detect from the interviews. Interviews and document analysis were used as a basis for describing the current situation in the company. The development ideas were formed based on the interviewees' suggestions and the case examples in the literature.

1.4 Structure of the Study

The outline of the thesis is divided into five chapters. Figure 1 visualizes the contents of each chapter.

Chapter 1: Introduction. The first chapter provides an overview of the topic and introduces the motivation and background for the thesis, research questions and goals, research method, and the structure of the study.

Chapter 2: Literature Review. The introduction is followed by the literature review, which introduces all the important concepts of the theoretical framework. The literature review has been prepared in a way it provides a relevant basis for the empirical research. Recent researches regarding CRM and customer information utilization are discussed.

Chapter 3: Methodology. The third chapter introduces the document analysis and semi-structured interview which are the data collection and analysis methods used in the research. Summary of the interviews is also provided in this chapter.

Chapter 4: Research and Results. The research and results chapter is the experimental part of the thesis. This chapter includes an overview of the current situation of CRM in the case company, suggestions for CRM implementation and development, as well as possible use cases for customer information utilization.

Chapter 5: Conclusions. The last chapter discusses about the most important findings aroused from the research, evaluates the research, and takes a look to the possible future prospects of CRM and information utilization.

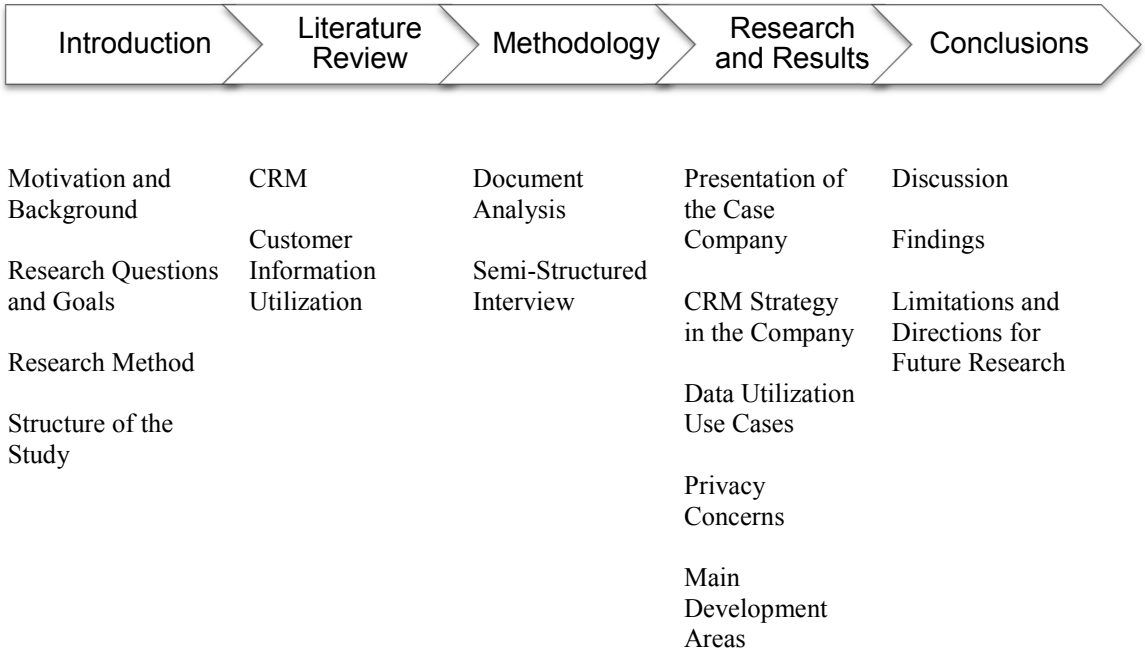


Figure 1: Outline of the thesis.

2 Literature Review

2.1 Customer Relationship Management

2.1.1 CRM Definition

There are various definitions for CRM depending from which perspective it is looked at. Gartner's definition for CRM is *"a business strategy that optimizes profitability, operational efficiency and customer satisfaction by implementing customer-centric processes"* (Sussin 2014). Finnegan and Currie (2010) see CRM as a process which collects information from different fields, such as about customers, market, and sales. Kumar and Petersen (2012) noted that the collected information can be implemented into the decision-making process of the company. The core business processes including operations, production, marketing, sales, and finance need to be automated, enhanced, and integrated for information processing (Kumar & Petersen 2012).

Gartner lists the Eight Essential Building Blocks of CRM initiatives that can be used to improve the effectiveness and success of organization's CRM projects (Thompson 2014):

1. Vision
2. Strategy
3. Customer experience
4. Organizational collaboration
5. Processes
6. Information
7. Metrics
8. Technology.

Examples of CRM projects contain automating sales force, campaign management, customer contact centers, digital commerce enabled by new technologies, Voice of the Customer (VoC), performance management, pricing, and social media. (Sussin 2014)

Customer value is a significant concept in CRM. It means customer's financial value to the company and is expressed, for example, as a contribution margin or net profit. Marketing efforts in the company are often defined by customer value. Customer value is not referred to any specific time span and is therefore a general term. Customer Lifetime Value (CLV), in turn, measures the customer's expected future profitability for the company over the customer's lifetime. (Kumar & Petersen 2012)

CRM strategies aim to a situation where companies would be more profitable by maximizing each customer's lifetime value. CRM is used to understand individual customer needs for more efficient marketing. The changes in the markets are increasing companies' interests towards CRM. Companies are under pressure adapting to rapid changes related to customer, technology, and marketing. Customers are getting less loyal and more value-conscious, which has encouraged companies to become more customer-centric, while changing their marketing strategy directions from product-based to customer-based. In addition, the remarkable growth in data storage technology has enabled CRM systems to process a significant amount of customer information. To be successful the companies need to identify different customer types and explore strategies to interact with each customer. One type of approach is to develop better relationship with profitable customers and terminate the relationships with the loyal but unprofitable customers. (Kumar & Petersen 2012)

2.1.2 Customer-Firm Relationship Stages

According to Kumar and Petersen (2012), four goals of CRM systems and strategies are: (1) get and (2) maintain profitable customers, (3) prevent them from moving to a competitor, and (4) win back customers that have terminated their relationships with the company. A good CRM strategy also helps to increase the profitability of an organization. Business success can be hampered if companies continuously expand their customer base rather than focus on keeping the existing customers. The four lifecycle stages of the customer-firm relationship are acquisition, retention, churn, and win-back. (Kumar & Petersen 2012)

Customer acquisition

The customer acquisition is the foundation step of the CRM process. The key components of this process are to identify which customers to acquire, evaluate the response rate to promotions, and understand what kind of effects marketing on customer acquisition might have. The acquisition philosophy has changed due to the development in the customer-firm relationship. The acquisition techniques have evolved from mass-level acquisition to segment-level acquisition, and finally to one-to-one acquisition. (Kumar & Petersen 2012)

The strategy of a traditional mass-level acquisition was to attain the highest possible customer acquisition rate by mass marketing (Kumar & Petersen 2012). Before Internet the most common channels for mass marketing were radio, television, and newspapers. In mass marketing, one item is promoted for all buyers. Companies such as Coca-Cola and Ford employed this strategy, as both companies offered only one kind of product: one kind of Coke in a standard bottle and a black colored Model-T Ford (Kotler et al. 2009).

In spite of the long-term success of the mass acquisition, the development of the customer-firm relationship required changes in the acquisition philosophy. Businesses started to pay attention to a growing trend of customer segmentation, which led to better understanding of customers. Companies began to segment customers to geographic segments based on the living areas, psychographic segments based on hobbies, and financial position segments based on purchasing characteristics. The business model of mobile phone companies' is an example of the segment-level acquisition, as mobile phone companies provide different packages for different segment groups of people. Different mobile plans are provided, for instance, based on the different frequency of usage. (Kumar & Petersen 2012)

An example of segmentation combined with customer acquisition is Nano car launched by Indian car manufacturer Tata Motors. Nano car was designed to the Indian lower-middle class who would like to own a car as a status symbol, but were not able to afford it before. Nano car was marketed to the segments based on both pricing and status symbol standpoint. (Kurczewski 2011)

According to Kumar & Petersen (2012), improvements in collecting, storing, and analyzing data have enabled more specific acquisition techniques. One-to-one acquisition is related especially to online commerce and interactions with customers (Kumar & Petersen 2012). Amazon.com is an example of an online store, which personalizes its web site to each customer's interests using recommendation algorithms (Linden et al. 2003). Adidas provides another example for one-to-one acquisition: Adidas gave an opportunity to its customers to personalize the Adizero soccer boots according to the customers' own taste (Kumar & Petersen 2012).

Customer retention

Customer retention process consists of customer relationship maintenance and development. Companies need to think carefully who to retain, when to retain, and how much to spend on a customer. Some customers might become unprofitable if their retaining costs are higher than their future profitability. Companies should treat their customers so that customer loyalty lasts for a long time. The available data can be used to measure customer's future profitability, which determines if the customer is worth retaining. (Kumar & Petersen 2012)

The scenarios about future profitability require predicting the future purchasing, product and marketing costs, and the expected time the customer will remain with the company. In segmentation-type analysis those customers who belong to the most desired segments, such as highest purchasing rates, are typically selected for retention programs. If customer profitability is analyzed in individual level through CLV or similar analysis, marketers can choose to focus on the profitable customers. (Winer 2001)

Monitoring customer's purchasing and attitudinal behavior allows companies to understand when to use the retention strategies. Statistical methods, where data related to customer transactions is analyzed over a period of time, enable companies to measure the future value of the customer. In order to improve the CRM process, the acquisition and retention processes should be viewed together rather than as separate processes. (Kumar & Petersen 2012)

Customer churn

Customer churn means loss of customers. Churn that is not noticed is harmful for firm's profitability. Many churning customers do not voice their opinions and reasons for churning. The first action related to customer churn is to identify which customers are about to leave. Identification is done by monitoring metrics such as customer purchase behavior and attitudinal response. Dissatisfied customers might have done fewer purchases, or their response for the marketing communications can be low. Firms should save those customers from churning, who would be the most profitable in the future. (Kumar & Petersen 2012)

Customer win-back

It is not possible to retain all customers, but winning back lost customers can improve the previous customer profitability. The first step of the win-back process is to identify which customers have left, and who are the potential ones to win back. After that, it is important to identify what should be offered to the customers to arouse their interest again. Finally, the costs for winning back the customer should be measured. (Kumar & Petersen 2012)

2.1.3 CRM Strategy Implementation

When planning CRM strategies, these three components of CRM implementation need to be examined: database, technology, and metrics (Kumar & Petersen 2012).

Database

Database is the core of CRM. It is relatively easy for telecom-related industries to construct a database, as they usually have many direct customer interactions and collect a large amount of customer information. (Winer 2001)

Databases store gathered information that companies can use for analyzing and marketing decision making. One of the first steps in CRM strategy implementation is to bring the data into a unified database and clean it by removing duplicate entries for the same customer. The two database categories are customer database and transaction database. Transaction database includes information related to the transactions that customers make. Transaction database can contain information about product, purchase frequency, and price. Customer database, in turn, is the storage of customer data. It consists of basic information, demographic information, psychographic information, and other relevant information. The basic information is customer's general information including name, address, and phone number. The demographic information refers to the components like age, gender, marital status, and education. The psychographic information is data related to customer's values, activities, and interests. Other relevant information can include, for example, customer's inquiries, satisfaction, and loyalty. (Kumar & Petersen 2012)

When analyzing the information stored in the databases, marketers can learn from active customers what is done right and from inactive customer what should be improved. Data can be categorized into primary and secondary data classes based on its availability. Primary data is the original data collected by a particular company. This type of data is collected from questionnaires, interviews, and observations made by the company. Collection of primary data is costly and time-consuming, but still necessary. The secondary data, in turn, is already available somewhere in internal or external sources. Business operations of a company, such as sales results and cost information, are examples of the internal sources. External information can be found from published data sources, such as books and newspapers; retail stores, warehouses, or other standardized sources of marketing data; and official or non-official customer feedback and reviews on the Internet. (Kumar & Petersen 2012)

Technology

Technology is growing fast and, therefore, CRM had also gone through development to achieve its current state. The three primary factors of CRM technologies are customer touchpoints, CRM applications, and data storage technology. Customer touchpoints have changed from the traditional physical interaction to interactions enabled by technologies of Voice over Internet Protocol, social networking, and speech recognition. The web- and phone-based interactions have started to replace most of the face-to-face interactions between customer and salesperson. As technology opens many possibilities, the CRM applications are offered in both traditional Enterprise Resource Planning (ERP) systems and online portals. The growth in the data storage technology has enabled companies to obtain a more complete picture of a customer. (Kumar & Petersen 2012)

In addition to the advantages of understanding a customer better, the technology has also caused challenges concerning the use of appropriate data (Kumar & Petersen 2012). The challenges related to privacy issues are discussed in section 2.2.5.

Metrics

Metrics provide a lot of benefits for the company as they measure customer values. Metrics can be utilized for controlling business processes and CRM activities, and

measuring revenue changes, costs, and profits. Metrics are also useful tools for achieving a desired level of performance and measuring on return on investment. Moreover, the benefits of using metrics include acquisition and retention support, churn prevention, and helping to win-back profitable customers. (Kumar & Petersen 2012)

Metrics can be divided into two categories to show how company or brand is ranked in the market: brand-level and customer-level metrics. The categories demonstrate how individual customer needs are different and how the company's competitiveness could be increased. Brand-level category measures how competitive the brand is in the market, including measurements for market share, sales growth, and customer equity. Customer-level metrics consist of components such as acquisition cost per customer, retention and churn rates, and CLV. (Kumar & Petersen 2012)

Mobile operators have started to look at Average Revenue Per Account (ARPA) rather than Average Revenue Per User (ARPU) to obtain a realistic view of subscriber revenue performance. ARPU can be calculated by dividing the total revenue by the number of subscribers. Different devices have often different pricing models, meaning that ARPU is not the most reliable metric anymore. ARPA, on the other hand, works well in today's markets, in which competitive strategy includes offering free services and subscriptions. (Lakhina 2013)

2.1.4 Steps of CRM Solution

The literature offers different approaches about how to develop a CRM solution. Gartner provides six fundamental steps for a structured approach that organizations can follow for CRM program implementation (Sussin 2014):

1. *Strategize and plan.* Scope the project and establish resources, budget, and governance.
2. *Architect solution.* Define the architecture, technology, and standards.
3. *Select solution.* Evaluate and choose the technologies and service providers.
4. *Build.* Design the technology implementation.
5. *Deploy.* Coordinate the solution deployment, train users, and receive user feedback.
6. *Operate and evolve.* Operate and manage implementation, measure performance, and develop skills.

Gartner's approach, however, concentrates strongly on the technical implementation. Another approach to develop a CRM solution is to follow the seven hierarchy steps where more advanced aspects of CRM are taken into account (Winer 2001):

1. *Create a database.* The foundation step of CRM solution is to construct the customer database.
2. *Analysis.* Traditionally the customer data has been analyzed by using statistical methods, such as discriminant and cluster analysis, in order to define the customer segments. The attention has been lately paid to each row or customer of the database instead of marketing for the average customers in the segment class. In other words, the aim is to understand each customer and his or her profitability to the firm. Each customer's profitability can be analyzed with the CLV formula.
3. *Customer selection.* The next step is to evaluate which customers should be targeted with the marketing campaigns. CLV analysis can be applied to choose which customers are worth retention.
4. *Customer targeting.* The direct marketing instead of mass marketing has increased its popularity. The Internet-based one-to-one marketing has enabled companies to build individual customer-firm relationships.
5. *Relationship marketing.* The goal of relationship marketing is to increase customer satisfaction. The customer expectations of product performance have grown because of competition, new marketing channels, and changes in customer needs. The satisfaction levels should be measured constantly in order to deliver performance beyond the expectations.
6. *Privacy issues*. The amount of personal information in databases and its usage causes many concerns. It may be difficult for companies to weigh what is the amount of information necessary to deliver customized products and services. The privacy issues should be considered throughout the all seven basic components of CRM model.
7. *Metrics.* The purpose of CRM-based measures is to better acquire and process internal data in order to increase company's performance.

2.1.5 Multi-Layered Model of CRM Strategy

According to Chen and Popovich (2003), CRM should not be seen as a technology-only solution, but an integrated and balanced approach to people, processes, and technology. Also Finnegan and Currie (2010) state that the technical imperatives get often too much concentration in the CRM implementation instead of focusing on in-depth understanding of the whole organization. Finnegan and Currie (2010) add a culture-aspect to the set of people, process, and technology, and these four key dimensions together form a multi-layered framework of CRM implementation, presented in figure 2.

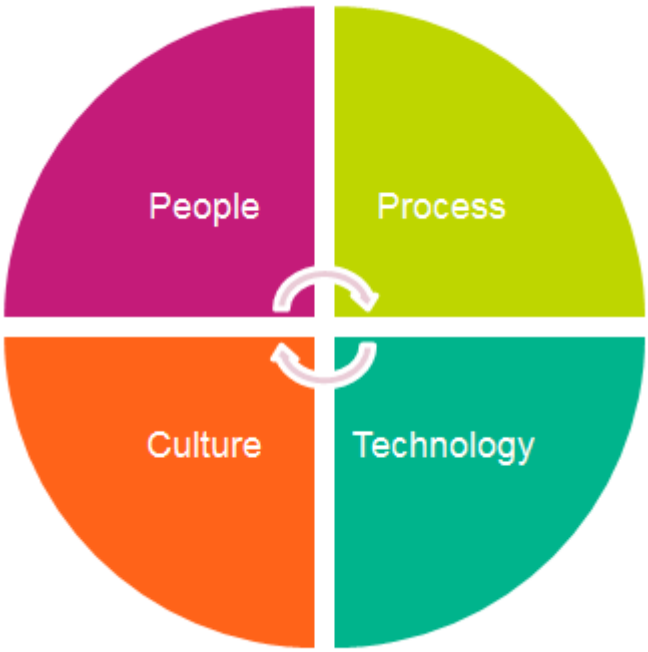


Figure 2: Multi-layered model of CRM strategy

Finnegan and Currie point out that CRM should not be understood only as software but a strategic approach which requires adaptation to the changing needs in the evolving relationships with the customers. A well implemented CRM strategy can improve customer acquiring, but ideally it can help retaining and developing existing and future customer relationships. (Finnegan & Currie 2010)

Implementing a CRM strategy needs people from different fields to define, deliver, and deploy the strategy successfully. The implementation requires a CRM project team with representatives from sales, marketing, service providers, customer

service, and information technology. It is important to make all employees adopt the strategy. The support should come from the top management at the beginning of the implementation project in order to motivate change and enforce accountability. Moreover, it is essential to have a change agent who ensures that the whole change process proceeds well, and who informs the top management if there is need for any further organizational change. There also needs to be a clear project scope, goals, sufficient resources, and realistic target dates. Technology can be an enabler, but may prevent face-to-face interactions. Employee involvement will strengthen ownership and commitment. Educational training programs can enhance employees' skills and knowledge, increase motivation, and reduce resistance. In addition, behavior can be monitored by reward mechanisms. (Finnegan & Currie 2010)

Chen and Popovich (2003) state that individual employees are the basis for customer relationships, but CRM requires also continuous effort to rethink the core business processes from the customer perspective. The processes need to be re-engineered so that they serve the needs and values of an individual customer (Chen & Popovich 2003). Customer loyalty can be increased by becoming proactive with customers and continuously improving the information flows between the front office, such as customer service, marketing, and sales; and back office, such as human resources, logistics, and financial operations (Finnegan & Currie 2010).

Customer oriented CRM strategy allows sharing information easier inside the organization. Change in the culture is necessary for an effective communication that reaches the all levels of employees throughout the entire project. Management should show interest to company-wide educational and training programs. CRM implementation needs effort across the organization, as it depends on resource availability, power structures, hierarchies, processes, and technical architectures. The company needs to deal with the barriers between the IT and marketing. The sales and development departments should be brought together when implementing CRM strategy. In addition to the organizational resistance to change, the individual resistance occurs when people are taken out of their comfort zones. Involving everyone for change can therefore be time and resource consuming. Changes all over the organization are, however, required for efficient integration and usage of a new technology. (Finnegan & Currie 2010)

2.1.6 Customer Experience Management

Customer experience management (CEM) is defined by Gartner as *"The practice of designing and reacting to customer interactions to meet or exceed customer expectations and to increase customer satisfaction, loyalty, and advocacy"*. In other words, all the impressions that a customer has with the company over the whole relationship cycle are summed up in CEM. The new areas of interests for customer support are growth of social media channels, customer's preference to self-service and Peer-to-Peer (P2P) support, and the needs to analyze customer behavior to measure the impact of sales and profitability. (Maoz & Sussin 2014)

Social Customer Relationship Management (SCRM), is an enrichment of CRM, which uses digital channels, such as social networks, to maintain and improve the customer relationships. Companies have changed their customer relationship approach from transactional to interactional and most enterprises have, for instance, a Facebook page or Twitter account to be visible in the social networks. SCRM is a customer engagement strategy to build trust with the customers and increase customer loyalty. Businesses need to continuously look for new customer engagement strategies and technologies to provide multi-channel support to the customers and sustain the competitive advantage of a company. (Maoz & Sussin 2014)

According to Verhoef et al. (2010), customer engagement is *"a behavioral manifestation toward the brand or firm that goes beyond transactions"*. The importance of customer-to-customer interaction has increased due to the growth of social media. (Verhoef et al. 2010)

The largest single software investment in CRM is post-sales support, such as customer care, customer service, technical support, and customer experience management. Customer support can be provided in three different cases: as customer engagement center (CEC), as customer self-service, or as P2P support. The support resolved in CEC occurs when one customer care agent provides help for the problem, inquiry, or issue. Customer self-service means that the support happens without an interaction with any customer care person. P2P support indicates that support comes from customers in external communities. (Maoz & Sussin 2014)

VoC is a strategic initiative which has business benefits, such as improved customer satisfaction, retention, and revenue growth. Analysis can be made from the outside-in view of customer feedback to improve customer experience, satisfaction, and

loyalty. Feedback data used to be limited to a customer satisfaction survey where participants were asked to score the questions on a range of 1 to 10. Nowadays the customer feedback exists in different channels, such as in call recordings, emails, blogs, and social media. One big challenge in VoC initiative is the expansion of the dataset and its' change from structured to unstructured. The data is spread to different parts of the organization in several formats and systems. (Davies & O'Kane 2013)

Net Promoter Score (NPS) is a tool developed by Fred Reichheld, Bain & Company, and Satmetrix for bringing VoC across the organization by measuring customer satisfaction and loyalty. NPS is based on a question "How likely is it that you would recommend our company to a friend or colleague?" where customers respond on a 0 to 10 scale. Customers are clustered in three groups according to their rating scale: Promoters (score 9-10), Passives (score 7-8), and Detractors (score 0-6). NPS is calculated by subtracting the percentage of Detractors from the percentage of Promoters. (Satmetrix Net Promoter Community 2015)

2.1.7 Data Governance

Governance in general is *"the way the organization goes about ensuring that strategies are set, monitored, and achieved"* (Rau 2004). Data governance refers to a set of processes assuring that data is trusted and formally managed throughout the enterprise (Sarsfield 2009). Data standards and data quality are important elements of data governance. These elements are visualized in figure 3.

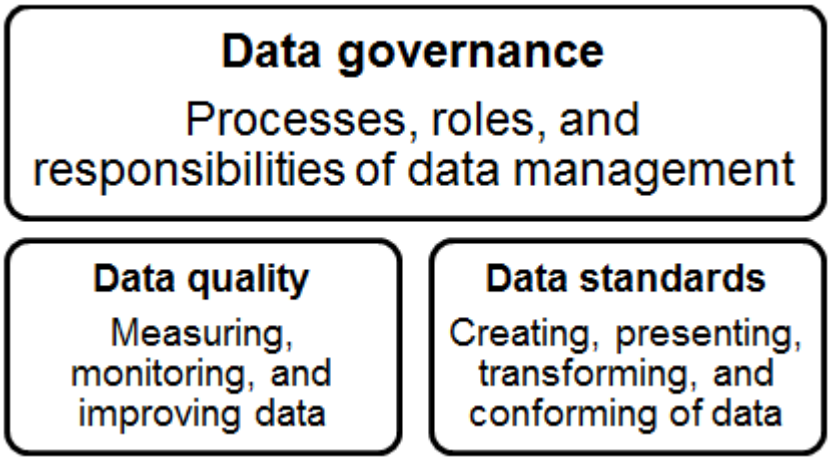


Figure 3: Data governance

Data standards define how data should be created, presented, transformed, and conformed, so that it remains consistent and is efficient to use. Data with inconsistent formatting is difficult to use and diminish the confidence of the data. Standardization prevents these inconsistencies and makes it easier to work with the data. Data standards help to ensure the consistent representation of data concepts. (Sebastian-Coleman 2013)

Data quality describes the quality of information system content. Data quality measures the value which the data provides to its user. Data quality metrics include, for example, authority, integrity, validity, timeliness, and uniqueness. (Roebuck 2011)

Poor data quality is one of the main reasons why business initiatives fail to achieve their targeted benefits. Organizations should have tools for measuring, monitoring, and improving data quality. (Friedman & Smith 2011)

The main goals of data governance are to set up master data management platforms, understand what data is available, gain access to the data, cleanse and standardize data, and manage metadata models. Data governance aims to reduce negative events caused by poor data quality. For instance, a CRM system may not meet its expectations as the incorrect data can cause problems in the system usage. Moreover, duplicates in data can lead to low marketing effectiveness and incorrect inventory levels can cause inability to ship products on time. Inaccurate billing is also a result of incorrect data. (Sarsfield 2009)

Data governance implementation requires people in charge to fix and prevent issues with data, and to improve organization's processes (Sarsfield 2009). Sarsfield (2009) and Weber et al. (2009) introduce the key data governance roles and responsibilities as: executive sponsor, project manager, business stakeholder, and data steward. These four roles together can also form a data governance council, which creates a de facto standard of better data management in an organization (Sarsfield 2009; Weber et al. 2009).

Executive sponsor is the top-driver of data governance, who monitors sponsorship, strategic direction, funding, and advocacy (Weber et al. 2009). Executive sponsor helps the data governance team to receive the resources they need and communicates the information quality benefits to the boardroom (Sarsfield 2009).

Project manager handles all communication, coordination, change management, and escalations regarding to the data governance project. Project manager preferably has technical background and good organizational and communication skills. One of the

main tasks of project manager is to keep the team engaged and interested. (Sarsfield 2009)

Business stakeholder sets the whole enterprise's data quality standards and policies from a business perspective (Weber et al. 2009). Data steward works on the technical aspects of the projects (Sarsfield 2009). Data steward's responsibilities include defining and formatting standardized data elements, as well as profiling and explaining source system details and data flows (Weber et al. 2009).

"Data's value must exceed its cost" is an assumption guiding data capture and retention. For example, storing low value data in an expensive storage can waste organization's resources, whereas storing critical data in unreliable storage can be inexpensive but risky. Because of the rapid growth of data quantity, organizations are facing a challenge to develop governance mechanisms that manage the value, risk, and cost of data. (Tallon 2013)

Table 1 highlights the enablers and inhibitors of data governance. While enablers may vary by industry, inhibitors apply equally across all business sectors. Focused business strategy helps organizations to success in their data governance practices. Organizations with a diverse set of products and services might have difficulties to find policies and standards that are compatible for each business division. Organizations which have both aligned IT and business strategy, and centralized IT and organization structure, usually agree on data governance, as it requires co-operation between customer information officers and business executives. It is difficult for decentralized organizations to create a set of data governance policies and standards that satisfy all parties equally. Regulations force organizations to consider appropriate system of policies. However, it has to be considered that regulations can vary, for example, in Europe depending on the country. It is difficult to protect and manage data when its integration is weak and data is duplicated across the organization. This is often caused by outdated IT systems. Moreover, needless retention of unstructured data limits the adoption of data governance. IT standardization and strategic use of IT can help organizations to devise common governance rules. (Tallon 2013)

Table 1: Data governance enablers and inhibitors (Adapted from Tallon 2013)

Enablers	Inhibitors
Organizational Factors	
Focused business strategy Aligned IT and business strategy Centralized IT and organizational structure	Complex mix of products and services Strategic misalignment Decentralized IT and organizational structure
Industry Factors	
Regulations Predictable rate of data growth	Regulations vary by region Absence of industry-wide data standards
Technological Factors	
Culture of promoting strategic use of IT IT standardization	Needless retention of data Legacy IT systems

2.2 Customer Information Utilization

2.2.1 Customer Segmentation

Customer segmentation helps companies to better understand their customers, as well as to provide personalized service and target marketing campaigns to the right users. There are different segmentation possibilities, such as general segmentation, purchase behavior classification, and likelihood to adopt a new innovation.

The four general types of customer segmentation are geographic, demographic, psychographic, and behavioral segmentation. In geographical segmentation the market is divided into geographical units, such as countries, cities, or neighborhoods. Demographic segmentation refers to market classification on the basis of the demographic factors, such as age, gender, income, or nationality. Psychographic segmentation divides people into groups that describe personality, lifestyle, or values. In behavioral segmentation potential customers are placed into groups based on their knowledge of or attitude towards the product. (Kotler et al. 2009)

Fonecta's purchase behavior classification divides people into eight main categories and 18 sub-categories based on their buying patterns, Internet habits, and lifestyle. The classes vary from price-sensitive young adults to high-income consumers. The classification can be used to profile customers and develop customer relationships. (TNS MediaMap 2012)

Rogers (2010) lists five adopter groups that divide members of a social system into different classes based on how likely they are adopting new ideas:

- Innovators
- Early adopters
- Early majority
- Late majority
- Laggards.

Innovators are the technology devotees who enjoy tinkering around new products. They offer to test new products and to report on the weaknesses. Early adopters are the opinion leaders who search for new technologies that can help them gaining a competitive advantage. They value personalized solutions and good service support more than low price. Early majority adopts the new technology when it already has a strong market share and its benefits are proven. Late majority is a skeptical and price sensitive group that adopts the new innovation only after when the majority of the population already has it. Laggards tend to resists the innovation and are the last group to adopt it. (Kotler et al. 2009)

2.2.2 Big Data

Big data is defined by Gartner as *"high-volume, high-velocity, and high-variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making"* (Sengar et al. 2014). Data within this definition is based on three characteristics of the "3Vs" model: volume, velocity, and variety (McAfee & Brynjolfsson 2012).

Volume refers to the quantity of data. More data is crossing the Internet every second than were stored there 20 years ago (McAfee & Brynjolfsson 2012). The amount of data that companies generate these days are measured in exabytes, a unit of measurement for digital data, which is the equivalent of one followed by 18 zeros (Kroll 2013). A study conducted by International Data Corporation predicts that the digital universe is expected to consist of 40,000 exabytes in 2020, whereas the amount of data in 2005 was only 130 exabytes (Gantz & Reinsel 2012). This means that the data volume will grow 300-fold by 2020. Data explosion is mainly result of new

technologies that generate and collect vast amounts of data (Hurwitz et al. 2013). Consumption of cloud-based services is increasing exponentially and nearly 40% of the information is estimated to be stored in a cloud by 2020 (Gantz & Reinsel 2012). Data growth is illustrated in figure 4.

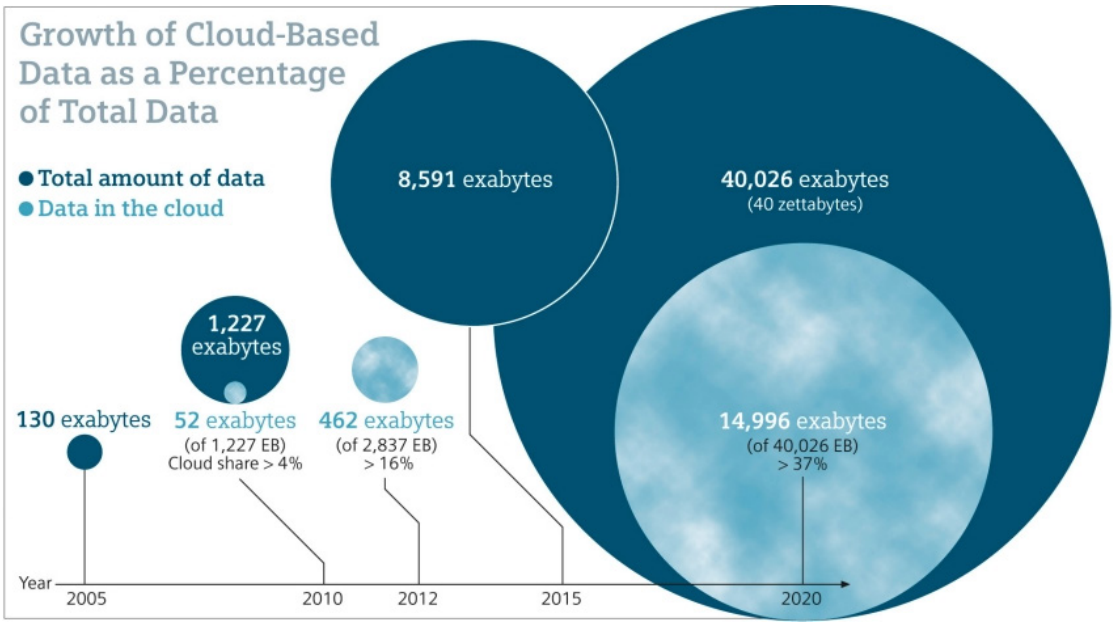


Figure 4: Data growth from 2005 to 2020 (Rohling 2014)

The speed of data creation is crucial for many real-time information processing. Rapid insights provide competitive advantage to companies. For instance, a MIT Media Lab group used mobile phone's location data to evaluate Macy's sales on a Black Friday by calculating the number of cars in the parking lots. The sales were recorded even before the transactions had taken place. (McAfee & Brynjolfsson 2012)

Digitization of many business activities has enabled new sources of information about people, activities, and location. Figure 5 shows the three types of information included in big data: business data, machine data, and human information. Business data containing structured transactional information is stored in databases, such as Enterprise Data Warehouses (EDW), and applications like CRM and ERP. Machine data consists of high velocity data in sensors, web and application logs, monitors, and security and intelligence systems. Human information, in turn, is unstructured data generated by different systems and devices, such as email, social media, documents, records, video, audio, and images. (Hewlett-Packard Development Company, L.P. 2014)

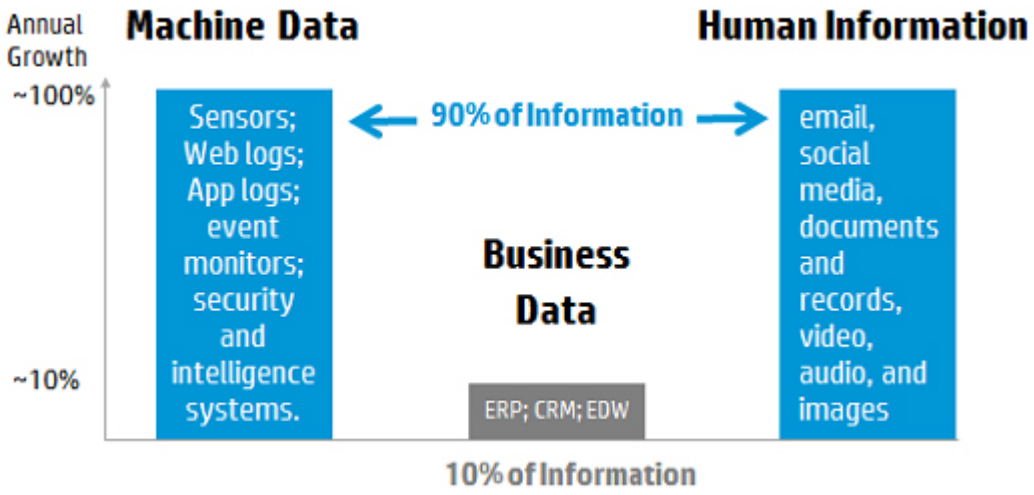


Figure 5: Types of information (Hewlett-Packard Development Company, L.P. 2014)

The amount of connected mobile devices in the world has surpassed the world population (GSMA Intelligence 2015). Each mobile phone generates numerous types of data daily, including call detail records, text message data, and location data. Smartphones create log data based on the use of mobile applications, financial transaction data from mobile banking and shopping, and social media data from social networks, such as Twitter and Facebook. (Kelly 2013)

Big data also has limitations. Insufficient processes, incoherent organizational setup and disparate technical systems are internal factors that complicate transformation of customer data into customer knowledge. For instance, data can be siloed and stored in multiple locations and collected by different divisions, be out-of-date, and have different granularity-levels. It is also problematic if management requirements are unclear and driven by ad hoc analyses. (Feiler et al. 2011)

The technology and business intelligence tools were originally designed to process only business data, which is just a small part of organization's information and grows not more than 10% per year, as illustrated in figure 5. The IT systems may have difficulties to manage machine data and human information, which together represent 90%-100% of organization's information. (Hewlett-Packard Development Company, L.P. 2014)

2.2.3 Data Collected by Telecom Operators

Telecom operators generate huge volumes of data from the telephony and data services they provide to their customers. The data types can be classified to four groups (Feiler et al. 2011):

- *Research data* is based on surveys and field research and is mainly used for segmentation purposes. Research data includes information about social and demographic characteristics and is not usually available on individual level.
- *Operational customer data* includes information about orders, contracts, billing, and customer devices. Moreover, basic information, such as names, addresses, gender, and age, is operational data. This type of data is used for campaigns and analysis, for example, by modeling churn and evaluating customer satisfaction with the network quality.
- *Network data* is information generated my mobile and fixed line networks. This type of data includes voice and data usage volumes, usage intensity, location-specific data, and user handset data. The technical faults are also reported as network data.
- *Contextual data* is generated in social networks, such as in Facebook or Twitter, by customers themselves. Telecom operators need to be involved in social communities to access this data.

Table 2 presents how operational and network data occurs in different parts of telecom operator's customer lifecycle. Feiler et al. (2011) define the customer lifecycle stages in this case as awareness, joining, (first) usage, paying and using, and upgrading, renewing, or exiting. The first contact with the customer occurs at the awareness stage, where marketing can collect operational customer data about the response rate of marketing campaigns and data for segmentation purposes. When customer joins the company and buys a service, operational data about customer details and installation process are generated in different parts of the organization. At the usage stage both operational and network data about installed services is being tracked. Operational data includes billing data and fault handling data. Network details and installation problems are examples of network data. Paying and using services generate operational data about accounting and network data about usage volume, location, and patterns. The stage of

upgrading, renewing, or exiting is the last phase of customer lifecycle. Operational customer data, for instance, about number of upgrades and termination reasons is collected at this stage.

Table 2: Data at the customer lifecycle stages (Adapted from Feiler et al. 2011)

Customer Lifecycle					
Lifecycle Stages	Awareness	Joining	(First) Usage	Paying & Using	Upgrading Renewing Exiting
Business Processes	Marketing process Segmentation process	Order & buying process Account generating process Installation process	Account-charging process Problem-solving process	Accounting & billing process Customer care processes	Upgrade & up-selling process Termination process
Data Examples					
Operational Customer Data	Response rate of marketing campaigns Segmentation data	Customer details Plan details Handset details Point-of-sale data	Customer accounting/ billing data Data concerning fault handling (type of problems, resolution time & rates, critical products, repeated faults)	Customer accounting/billing data Recommendations for retention	Number of successful upgrades Reasons for termination
Network Data			Data in connection with installation process (network details, SIM details, installation problems)	Used minutes / text messages / data Location of usage (mobile) and type of connections Usage patterns	

2.2.4 Data Utilization Cases

Organizations have started to use predictive and prescriptive analytics in order to meet growing customer requirements. These analytics enable organizations to engage customers real-time at different touchpoints and contexts. Big data maximizes the value of customer data and enables organizations to explore what is knowable about the customer beyond what is already known. (Sengar et al. 2014)

Moreover, big data gleans intelligence from the data and translates it into business advantage. Big data supports managers' ability to measure and learn more about their businesses. This business knowledge can be utilized in the decision-making process of the company to improve business performance. (McAfee & Brynjolfsson 2012)

The big data use cases for CRM vary across organizations and functions. Companies have started to use social data in real-time market research. Social data and analytics have enabled identification of market characteristics and opportunities, as well as measurement of marketing campaign success and effectiveness of customer service. For instance, a South East Asian telecom provider analyzed subscriber characteristics, such as product and churn propensity. Usage of these predictive models doubled the marketing campaign response rate. (Sengar et al. 2014)

Digital commerce uses predictive and adaptive big data analytics to provide smooth commerce experience in online stores and other digital merchandising systems. Customer data, browsing activity, and third-party data, such as product reviews, are analyzed to suggest an appropriate next step for customers. For instance, marketplaces, such as Amazon and eBay, use data to group, select, and place products on pages, and promote products to customers. (Sengar et al. 2014)

Big data can be used to target customers for marketing purposes. Business-to-Consumer (B2C) marketing organizations are interested in information about new types of behavioral and psychographic information, such as customer behavior, preferences, and buying patterns. Near-real-time or real-time offers are then made by using event-triggered or inbound marketing techniques. Behavioral and psychographic information is also used to segment customers based on their needs, wants, and desires. Moreover, the interest towards contextual and location-based marketing using mobile devices is increasing. Some companies develop mobile applications to provide value to their

customers and, at the same time, collect information about the customers for cross-sell and up-sell purposes. (Sengar et al. 2014)

Customers expect sellers to know them and to offer only relevant content rather than wasting customers' time by meaningless suggestions. Digital personalization is enabled by prescriptive and adaptive analytics that provide information based on shoppers' behavior. The self-learning and advice-issuing analytics are used to identify even anonymous online shoppers and offer them content that meets the customers' interests. The shoppers are offered information based on both previous and current shopping behavior. The best digital experience can be offered when the analytics are used together with big data. Content that is already seen or considered as not interesting based on the previous behavior is avoided to be shown for the customer. When the customer clicks something on the website, information about the customer is collected for smart personalization. Being more customer-centric than product-centric will increase customer loyalty and satisfaction. (Sengar et al. 2014)

Sales organizations analyze data collected from internal systems. Sources of data can be, for example, transactional systems, VoC, customer service, external data from partners, social media, and the Web. Big data predictive analyses in customer service provide rich, analytical, and personalized customer services which increase customer satisfaction. Benefits include increased revenue and customer retention. Better understanding of the issues a customer is experiencing helps to avoid problems and resolve issues before the customer reaches the customer service. Big data analytics enable flow of real-time information and faster alerts of customer issues, meaning effective and proactive resolutions of customer concerns. (Sengar et al. 2014)

2.2.5 Privacy Issues

All information held by organizations is subject to threats, such as attacks, errors, and natural phenomena. The term *"information security"* is based on the fact that the valuable information requires protection against the loss of confidentiality, integrity, and availability. These three main dimensions of information security are also known as a CIA-model. Confidentiality means that information is available only for authorized; integrity indicates that information is accurate and not changed from the original; and availability ensures that authorized have access to information whenever is needed. In addition, the elements, such as authenticity, accountability, non-repudiation, and

reliability, can also be added to describe information security. Maintenance and improvement of information security is essential to the organization's legal compliance and public image. (Finnish Standards Association SFS 2009)

According to the Finnish Personal Data Act 523/1999, the purpose of personal data processing shall be defined before the data collection or organization of the data into a personal data file. Personal data is allowed to be processed for research and statistical purposes only if individuals cannot be identified from the result. Personal data can be collected for direct marketing and other personalized mailing purposes unless it has been prohibited by the data subject. Personal data shall be secured against unauthorized access and the file shall be destroyed or transferred to be archived when it is no longer necessary for the controller's operations. (Ministry of Justice 2015)

The European Union regulates the periods that mobile network operators have to retain the collected data. The directive 2006/24/EC involves the mobile network operators of EU member states to store data that is necessary in identifying the source, destination, and type of communication, and location of user's communication equipment for not less than six months and not more than two years. (European Parliament and the Council 2006)

The EU's 1995 data protection directive regulates the processing of personal data and free movement within the European Union. In 2012 European Commission proposed modernization of these rules, as technological developments and globalization have caused new challenges for data protection. The changes include, for example, individual's right to be forgotten, which means that the person's information must be able to be removed from various services on request. Also consent for data processing needs to be given explicitly rather than be assumed. Data access will be made easier for the individuals as well. Privacy by design means that privacy must be embedded into the design of the products and services already in the development phase. Sanctions in case of breach of the law can be up to 5% of the company's annual worldwide turnover. (European Commission 2014)

It is important for companies frequently review their policies about data collection, storage, and analysis. Customers have become more aware about how companies use their personal data, which has resulted in increased concerns. The ethical and privacy issues related to big data should be concerned organization-wide, which requires team-effort from senior management, legal department, IT, analytics, and internal audit. Senior management must take care of the potential strategic value of big

data analytics. Legal department ensures that the laws and regulations are in order, whereas IT is responsible for maintaining and securing the big data infrastructure. Analytics are, in turn, involved in the objectives and constraints for analytics projects and the internal audit deals with overall risk and reward strategies. (Watson 2014)

Big data enables companies to increase their revenues and profits by better customer service and targeted offers. However, it is difficult to find a balance between benefits and privacy considering the preferences of all individuals. For instance, Google's advertisements are based on the content of users Gmail messages, which are read by using bots. Advertisement created using sensitive e-mail content may seem offensive from someone's opinion, even if the purpose is to provide targeted services to the user. Companies need to weigh what is the necessary amount of information to implement their businesses. Some argue that it is more beneficial for the customers if they provide as much data about themselves as possible. However, direct marketing based on personal information can cause irritation and feelings of violation. (Watson 2014)

Privacy and online invasions of privacy can be characterized in three different ways (Clemons et al. 2014):

1. *Uninvited intrusion into the users' personal space* can contain spam advertising, online marketing, sponsored sites, and pop-ups in the web pages. This type of privacy violation is seen as the most significant in user's minds, even if the likely consequences are the most harmless (Watson 2014).
2. *Identity theft and false e-commerce transactions* are the most alarming forms of privacy violation. However, consumers do not connect big data companies, such as Google or Yahoo, to these types of threats.
3. *Personal profiling for commercial advantage* is a type of invasion where an individual is uniquely identified by a big data company and associated with one or more characteristic for targeted advertisement purposes.

An American broadband and telecommunications company Verizon has been criticized about violating customer's privacy, when the company created a short term serial number to better serve advertisers on the Web. This permanent cookie can be used to build a profile of the user's web activity and it can be read by any visited web server.

This feature bypasses many browser privacy mechanisms, as it does not ask user's consent and refuses to be turned off. (McMillan 2014)

Companies use data anonymization to protect the sensitive data, including personal information about their customers. Data anonymization is a technology where clear text data is converted into non-human readable form (United States Department of Justice 2006). After anonymization the data is transferred into a form from which the individuals cannot be identified anymore (Graham 2012). Anonymization can enable new data utilization possibilities, but especially privacy in social networks has become a serious concern (Zhou et al. 2008). For instance, half million anonymized Netflix subscribers were identified with a de-anonymization methodology where Internet Movie Database ratings were linked with Netflix users (Narayanan & Shmatikov 2008).

There is a fine line between privacy and personalization. The risk is that personalization can lead to customer over-contact or fatigue. Marketing needs help from the technology to manage the concerns about privacy when the information is sensitive. It is also important that marketers know how to handle big data in meaningful ways to enhance customer experience. IT can provide a strong technical foundation to support strategic big data which effectively drives customer experience. (Sengar et al. 2014)

3 Methodology

This research is conducted as a qualitative analysis, consisting of literature review and empirical research. Qualitative analysis is a process where data is analyzed and defined in order to gain knowledge (Corbin & Strauss 2008). The literature review has been compiled from various electronic sources, such as books, journal articles, blogs, and directives. The aim of the empirical research is to identify how equivalent the current situation and the introduced conceptual framework are. The empirical data collection methods that are used in the study are document analysis and semi-structured interview.

3.1 Document Analysis

Document analysis is a qualitative research method which has increased its popularity in reports and journal articles in recent years. Document analysis means reviewing or evaluating either printed or electronic documents. The forms of documents can consist of manuals, letters, memoranda, maps, charts, press releases, organizational or institutional reports, and survey data. These documents can be found in organizational or institutional files, libraries, historical society offices, or newspaper archives. Another qualitative research method is often used together with the document analysis in order to confirm the research findings. (Bowen 2009)

Document analysis has many advantages. It is less time consuming and cheaper than most of the research methods. Many documents are available to the public and obtainable without the author's permission. Document analysis is a fast method as the data in the documents is already collected and only evaluation of the content and quality is needed. Documents are non-reactive and, therefore, they are suitable for repeated reviews and not affected by the research process. Exactness and wide coverage of information makes documents advantageous in the research process. (Bowen 2009)

There exist some limitations on document analysis as well. Documents are not originally produced for research purposes, which is the reason why they do not usually produce enough information for the research scope. Moreover, document retrieval can be difficult. The available documents are often aligned with corporate policies in an organizational context, which can cause biased selectivity. However, the advantages of document analysis outweigh its limitations. (Bowen 2009)

Documents used for the research are business process descriptions and pictures, information system overviews, and documents about customer privacy in the

organization. Business processes were reviewed in order to obtain an understanding about the content of business processes. Information system overviews were examined to learn about system functionalities. Privacy document review helped to understand the customer privacy governance framework in the organization.

3.2 Semi-Structured Interview

Qualitative research methods, such as observation, interviews, and discourse analysis, have become the most popular methods of social research since the 1980s. In qualitative interview the subjects describe their activities, experiences, and opinions in their own words. An interview is a professional interaction with a structure and a purpose determined by the interviewer. (Kvale 2007)

An interview situation can vary from totally unstructured, through semi-structured, to highly formal interactions. The interview method used in this research is semi-structured interview. Semi-structured interview is an open-ended scheduled activity following a script and covering a list of topics. This type of interview is helpful when the same person can be interviewed only once. Semi-structured interviews use an interview guide to ensure that the data is reliable, comparable, and qualitative. Interview guide is a list of topics or questions that need to be covered during the conversation. In semi-structured interview the questions are tailored to the interview context, providing an opportunity to identify new perspectives of the topic during the interview. (Bernard 2011)

According to Kvale (2007), the semi-structured interview *"seeks to obtain descriptions of the life-world of the interviewee with respect to interpreting the meaning of the described phenomenon"*. The options for collecting these descriptions are face-to-face, telephone, online, and self-administered interviews, such as mailed questionnaires (Bernard 2011).

The chosen data-collection method depends on cost, convenience, and the nature of the questions being asked. Face-to-face interviews usually last longer than the other types of interviews and can therefore provide more information than other methods. However, it may save time and money to choose another method than face-to-face interview, especially if the questions do not require any visual support, such as graphs or charts. (Bernard 2011)

Interview recording methods include audiotape recording, videotape recording, note-taking, and remembering. Recording allows the interviewer to focus on the topic and the dynamics of the interview. It is recommended that the recordings are transferred to a computer where they can be stored and played for an analysis. (Kvale 2007)

Kvale (2007) lists seven stages that an interview inquiry is suggested to follow:

1. *Thematizing*. Define the purpose of the investigation and the conception of the theme before the interview starts. Find out what you will study before deciding how.
2. *Designing*. Plan the design of the study before interviewing and take into consideration the all stages of the interview.
3. *Interviewing*. Conduct the actual interviews based on interview guides.
4. *Transcribing*. Translate the interview to written text for analysis.
5. *Analyzing*. Choose the modes of analysis on the basis of the purpose, topic, and nature of the investigation.
6. *Verifying*. Check the reliability (how consistent the results are), validity (how well the study corresponds to the original aim of the study), and generalizability (can the results be applied to other contexts) of the interview findings.
7. *Reporting*. Communicate the findings of the study taking into account the scientific criteria, ethical aspects, and readability of the results.

3.2.1 Analysis Method

Interview analyzing techniques are grouped into analyses that focus on the meaning and what is said, and analyses that focus on language and the forms how meanings are expressed. Meaning analysis techniques are coding, condensation, and interpretation of meaning. In meaning coding, tags or keywords are added to the text segments that represent the main themes of the interviews. In meaning condensation, the coded texts are condensed into categories, and the statements expressed by the interviewees are compressed into shorter formulations that describe the central idea or meaning. Meaning interpretation in turn is a method where more details, background, and context are added to the specific parts of the interview. (Kvale 2007) The interviews in this thesis are analyzed using these five steps of meaning analysis, introduced by Kvale (2007):

1. Read through the interview to understand the overall picture.
2. Determine the natural meaning units of the text.
3. Restate the theme that dominates the natural meaning unit as simply as possible and thematize the statements.
4. Examine the meaning units in terms of the purpose of the research.
5. Tie together the nonredundant themes into a descriptive statement.

3.2.2 Practical Arrangements

All selected interviews were experts on the issues involved in CRM and customer information utilization, each from slightly different perspectives. The interview questions were formed on the basis of the previous studies presented in the literature part. The questions were designed to examine the current situation of CRM and customer information utilization in the organization.

The interviews were conducted during two weeks in March and April 2015 in the company's office. The interview invitations, including proposals for interview times, description of the topic, and planned interview questions, were sent to the interviewees one to two weeks prior to the interview. Interview invitation can be found in appendix A and questions in appendix B. Five out of six interviews were face-to-face interviews conducted in conference rooms. One interview was conducted as an online meeting via company's internal communication software as the interviewee was working in another office. One hour reservation was made for each interview, but due to the rescheduling, one interview was needed to be conducted in half an hour. All the interviews were audio-recorded with the interviewees' permission. In addition, notes were taken during the interviews. The recorded interviews were transcribed into text soon after the interviews, producing in total twenty pages of text.

Verifying the reliability was done during the interviews. The issues that came up in the interview situation were verbally confirmed from the interviewees themselves. The validity and generalizability were checked in the interview analysis process. Those interview results, that were identified to answer to the research questions, were analyzed in more detail. The literature part was continuously reviewed to generalize the interview results to the extent it was possible to apply them to other contexts. Example cases from the case company that arouse from the interviews were reported to support the general findings.

3.2.3 Summary of the Interviews

The interviewees' titles, responsibilities, and their working experience in the company are summarized in table 3. Many roles in the company are rather new due to the organizational changes occurred in recent years. Even if the interviewees have worked in their current positions only for one to three years, many of them, however, have experience in similar tasks over several years.

Table 3: Interviewees

Title of the Interviewee	**Responsibilities**	**Work Experience in the Current Position**	**Total Work Experience in the Company**
Department Manager, Information Management	Development of information management	1 year	15 years
Department Manager, Delivery Services	Consumer delivery services Delivery & install process manager	3 years	15 years
Privacy Officer / Senior Legal Counsel	Privacy Data protection	1 year	18 years
Head of Consumer Offering	B2C Offering Market Process Manager	2 years	8 years
Head of Customer Insight and Analysis	Consumer customer insight and analysis	1 year	15 years
Head of IT Architecture	IT systems and architecture	1 year	20 years

The interviews were analyzed using meaning condensation method. Table 4 illustrates the four main categories with several sub-categories that were formed based on the key findings of the interviews. To better analyze the interviewees' opinions, the categories were divided into three classes: positive, negative, and development ideas. Meaning condensation of the interviews is available in the appendix C.

Table 4: Interview categories and sub-categories

Categories	**CRM**	**Data Quality**	**Data Utilization**	**Privacy**
Sub-categories	Technical implementation 360-degree view of the customer Customer lifecycle process	Data governance Data standards Technology limitations	Identifying customer needs Digital marketing Data commercialization Process development	Data retention Permissions to view the data Identified and anonymous data

4 Research and Results

4.1 Presentation of the Case Company

4.1.1 Background

The case company is one of the leading telephone and mobile network operators in Finland. The operator is also counted as one of Finland's largest invoicing companies, as it sends each year about 20 million invoices. Most of operators' profits come from invoicing, in which correct customer information plays a significant role.

The company reorganized its business areas in 2014 to support more customer-centered than technology-centered approach. Mobility services and broadband services used to be in different business areas, but nowadays those are viewed together.

There is an ongoing transformation program in the company that started in the end of 2014, aiming to increase the customer satisfaction and staff motivation by renewing many organizational operations. The desired outcome of the program is to form new customer-oriented business structure by simplifying internal operations, including IT architecture and processes.

During the last few years the company has released two projects focusing on data quality. The first one of these projects started in the end of 2012 and aims to correct errors in the network information. Another project that started in 2014 is focused on improving the customer information quality by finding the root causes of quality errors in the processes that handle the information. The latter data quality project also ensures that the processes operate in accordance with both the upcoming new EU privacy directive and the organization's privacy guidelines.

4.1.2 Customer Information Framework

Customer information processing in the organization can be seen to consist of co-operation of three factors: IT and processes, sell and marketing, and legislation. These relationships are illustrated in figure 6. Systems, process pictures, and data flows are tools of IT and processes for customer information processing. These tools allow sell and marketing to make big data analyses about customer information. Successful customer segmentation and targeted marketing campaigns support company's business performance. The policies, instructions, and guidelines of the company together with

the Finnish legislation and the EU directives define the customer data processing principles. Legislation, in turn, regulates the right of IT and processes, as well as sales and marketing, to process customer information.

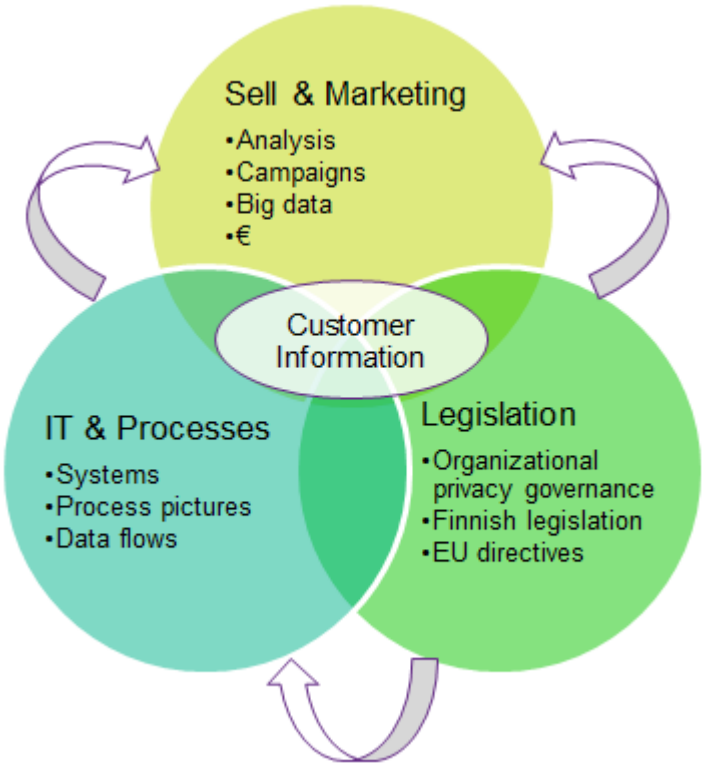


Figure 6: Customer information framework

Customer information is important for the company for many reasons. Cash flow is largely dependent on the fact that customer information is of good quality as the products that company sells are charged afterwards. Correct information about customers is needed for smooth services and delivery handling as promised in the point-of-sale. Customer information is in the future even more crucial as good customer experience and understanding is highlighted in the competitive market. Customer understanding controls the business as companies can make fast and good decisions based on it. Any efficient CRM actions including customer segmentation and behavior modeling could not be done without valid customer information.

4.1.3 Overview of the Processes

The company has constructed seven business processes, which are Product, Market, Sell, Deliver & Install, Service Assurance, Service & Support, and Bill. Table 5 provides a short description and output of each process, and shows which processes are related to certain customer touchpoints. Customer touchpoints defined by the company are: need, find, buy, receive, install, use, and pay.

Table 5: Process descriptions

Customer Touchpoint	**Process**	**Description**	**Output**
Need / Find	Product	Developing and creating products based on customer needs	Product is ready for market
	Market	Creating campaigns and offers based on customer needs	Offer is ready and campaign is launched
Buy	Sell	Creating sales opportunities to support customer needs and ensuring that the customer gets what he/she wants	Order is placed
Receive / Install	Deliver & Install	Delivering efficiently and on-time, providing delivery status information, and ensuring the customer can start using the product or service	Product or service is in use
Use	Service Assurance	Managing incidents, problems, and changes	Service is functioning
	Service & Support	Receiving and handling service requests from customers	Inquiry is resolved and product or service is restored
Pay	Bill	Providing correct invoices and payment options to customers	Payment is collected

4.1.4 Overview of the Data Systems

The complexity of the IT architecture arises from the fact that there are in total more than one hundred different data systems in use in the company. The huge number of the systems is due to the development of several operation models over the years. The technology areas used to be more differentiated, each having their own data systems. New systems have been later built on top of the legacy systems, which has increased the

number of the systems. Table 6 summarizes those consumer customer data systems and their main functions that are relevant for this study.

Table 6: Consumer customer data systems

System	**Main Functions**
Consumer data master	Customer ID-master Creation of new customers Maintenance of customer information
Data warehouse system	Data storage for marketing and campaign purposes Registration and handling of customer feedback
Agent's desktop	Tool for customer service channels for collecting, fast search, and view of customer data
CRM systems	CRM systems for different product/technology areas Maintenance and management of customers' products and services

Consumer data master handles all the ID numbers that identify the customers. Consumer customer official data including name, address, and social security number is also mastered in this data master system. Consumer data master receives address updates from a Finnish postal service company Posti and transfers the updates to the other systems.

The relevant data about the interaction with the customer is stored in the data warehouse system. The system receives new or updated contacts and feedback from the consumer data master. The data in the warehouse system is reported and analysed for marketing and campaign use.

The agent's desktop is a browser-based tool for customer service and sales operators to review the customer information. At present, the agent's desktop is mainly intended to collect, fast search, and view of customer data, and it works as a CRM interface for the consumer customers. The company aims to utilize the agent's desktop even better in the future. The possible additional features in the agent's desktop could include showing more information about the customer and providing campaign suggestions based on customer segmentation for a specific customer.

There are different CRM systems for different technology areas. These systems handle the maintenance and management of customers and services in that specific product class.

4.2 CRM Strategy in the Company

4.2.1 CRM Processes

There are two processes related to CRM that go side by side in the company: process to improve customer experience and a commercial process to enhance customer value. B2C Process Excellence Team (PET) consists of process owners from all the different business processes. The team meets regularly to consider possible development ideas for the processes based on customer feedback. Product, Market, and Sell processes together form a commercial process which aims to ensure that the customer concentrates all the services to this company. PET and commercial processes strongly co-operate with each other as it has been understood that good customer experience notably increases sales.

Processes, functions, and information are tools to support CRM. The overall picture of CRM in the company needs clarification, as CRM is implemented in a way the CRM tools have been built in the history. The company has managed to improve its CRM a lot over the past few years, such as being visible as a one company to the customer. These improvements include integrating IT systems, developing an online-view, and enabling one invoice that consist of products from different technology areas.

The company puts effort on clarifying its CRM view, and there have been improvements for more strategic CRM approach. CRM has been strongly based on marketing activities, such as billing history analyzing to acquire better understanding of the customer. CRM used to refer more to the technical systems, but recently it has been realized that the technical implementation alone is not enough for an efficient CRM strategy. Need for a unified organization-wide CRM has become even more important during the past few years, including the CRM strategy.

PET and commercial process together have visibly improved the end-to-end process fluency. The ongoing transformation project, as well as the organizational changes, has driven the company to take even more customer-centered direction. Based on the interviews there is, however, a strong need for a party responsible for the end-to-end customer information management in the company. Moreover, there is no customer manager or process that would describe the end-to-end customer lifecycle both from the customer and organizational perspective. The CRM process needs development and the responsibilities related to CRM need to be defined. The role of customer information

should be described in each business process, as customer information aspects can vary between different processes. For example, the payer's contact information is the most valuable information for the billing process, whereas fault management is more interested about the contact person's information.

There is a need for an entity that is responsible for the customer lifecycle and also the validity of the customer information. It would be useful to have an information map that defines customer information and describes what it means to different processes and functions.

4.2.2 CRM Data System Integration

The company is going towards more centralized and consolidated CRM that is least dependent on technology aspects. The advantages of one centralized IT system include unified data standards and an ability to define customer roles in a consistent way. Privacy issues can also be taken better into account in a centralized system. However, it has to be noticed that CRM system implementation is always time-consuming.

One centralized CRM system would increase the efficiency as the information would be available in one place. Quality problems would then reduce and data remain up-to-date. It is also less risky when information does not need to flow into many systems, as the information could break at some point between the systems.

The risks of several data systems include difficulties to remove information from all of the systems due to the data quality problems. In some information processing cases there are bigger risks related to the information quality. For instance, it is problematic to identify between the systems those customers who do not have a Finnish social security number. Moreover, manually entered data is more sensitive to errors than automatically created data.

The company is preparing themselves for the forthcoming EU directive reform by developing CRM and updating legacy systems. It requires work to ensure that the data in all systems is of high quality due to the complex IT architecture.

4.2.3 Customer Information Quality

Reliable customer data is a prerequisite for the strategy where customer insight guides the company's actions. Data governance in the company used to be siloed due to the structural solutions in the past years. This led to reduction in the data quality. Data

governance has been improved during the ongoing year thanks to the actions concentrating on data quality correction.

Recently made customer data analyses prove that the data in the company's data systems is of good quality. However, the quality of customer information is maintained in a more reactive than proactive mode. A dedicated team makes manual customer data correction to the data systems as a full-time job. Information is corrected, for instance, when an invoice is returned or customer contacts to the customer service because of an incorrect information. It should be ensured in every customer touchpoint that customer information is up-to-date and the corrections should be made before the customer notices the incorrect information. The company is going to add more automatics to the IT architecture, including self-correction mechanism. Customer's ability to update the information him or herself is under development as well. However, it is also possible that a customer can make errors when entering personal information.

Incorrect or not updated information causes many problems, which can lead to customer dissatisfaction. For instance, a sold product can be impossible to deliver to the customer as a result of entering incorrect information to the system in the sales situation. It is also possible that marketing campaigns are targeted to the wrong customers because of the incorrect customer information. The aim of targeted campaigns is to provide excellent service experience to the customers. Currently part of the marketing operations in the company does not reach the customers due to the incorrect customer information. It is essential for regional campaigns that the addresses are up-to-date, so that the marketing can reach all the targeted customers. Marketing campaigns assigned to incorrect addresses also cause unnecessary costs for the company. Reasons for out-of-date data include situations when information is not corrected to all relevant systems, or sales agents simply forget to ask if contact information is still up-to-date. There is no official database for e-mail addresses and the updating is fully dependent on the information given by the customers. Maintaining e-mail addresses up-to-date is crucial as e-mail is becoming more and more important customer contact channel.

4.2.4 Customer Feedback

Customer feedback is continuously collected using different VoC tools as the company wants to distinguish itself in the market with the best customer experience. Feedback is

also utilized in process development. The aim of NPS and customer effort surveys is to collect feedback in a wide range of customer touchpoints, such as with new customers, customer care situations, churn, and in other situations to develop customer relationships. The company also contacts back its customers in certain feedback categories.

NPS surveys ask the likelihood of recommendation on the company after different situations. These questionnaires include four different types: customer relationship, join, fault fix, and lifecycle surveys. First, the customer relationship survey is sent regularly to randomly selected customers. Second, the join survey is sent for new or existing customers after a purchase and asks how likely the customer is to recommend the company to others based on the delivery process. Third, the fault fix survey asks the customer's opinion after an occurred fault condition is corrected. Fourth, the survey based on a customer lifecycle is sent after a certain period of service usage.

Customer effort survey measures customer experience in different situations. The experience can consist of calling to customer service or using a self-service. The customer effort survey is also sent after a purchase situation. The effort score measures how easy customer finds the service. The easier the customer finds the service, the more it increases customer loyalty.

4.2.5 Evaluation of Customer-Firm Relationship Stages

This section aims to summarize how customer-firm relationship stages are implemented in the company. The stages of customer acquisition, retention, churn, and win-back were previously presented in section 2.1.2. Obtaining and keeping profitable customers is the goal of the market process. The commercial model of the market process consists of new sales, up-sales, and churn processes.

New sales aim at obtaining the amount of new customers defined in the business plan. The company aims to broaden its customer base to consist of all five different adopter groups: innovators, early adopters, early majority, late majority, and laggards. It is necessary for the market communication to reach all these adopter groups to bring new products successfully to the marketplace. The company should find places and ways to reach all of these customer segments and analyze the data of the existing customers in the data warehouse system. To date, the company knows the kinds of customers that should be acquired but has not quite reached the goal.

The up-sales process makes actions related to current customers, including direct marketing and customer segmentation, and is clearly based on customer information. The segmentation process works in two ways. It can start from an idea about a product that should be marketed with a product-specific target. Suitable customers for the product are then selected from the customer base. Another option is to identify customers that are likely to buy products and to tailor a marketing campaign for them. The customer relationship should be improved in every customer touchpoint.

The churn process aims to keep as many customers as possible to stay with the company. Churn handles ending offers and contracts and seeks to find the churn sensitive customers. The proactive churn model aims to identify customers from the customer base that are most likely to leave, including customers who, for example, have an ending contract or offer. These customers are then contacted in order to extend their contract and customership. When the company receives information about a leaving customer who has banned telesales, it is prohibited to contact the customer by calling him or her. The company needs to consider other options for churn preventing actions in this case. The company could activate the customers to call back by sending an e-mail or SMS message. Churn can be prevented through keeping product-pricing reasonable. Different campaigns could be tailored to those customer segments that are churn-sensitive. Preventing actions for customer churn are made in the delivery services as well. If a service is impossible to be delivered, another option should be offered to replace it as termination should not be seen as the only option. A typical example of fixed-line telephony service customers contacting the company is that they want to terminate their service. The reason is that fixed-line business is decreasing all the time, as fixed-line voice traffic has been shifting to the mobile services for the past few years. In this kind of situations it is natural to provide the customer a replacing service that uses a different kind of technology.

There are not many visible win-back actions in the marketing strategy of the company, and the company should better utilize the customer information of those who have churned. Customers usually make two-year contracts with a new operator and the company aims to find a suitable time for making win-back actions for the churned customers. After customers have moved to another operator, the contact information in the customer database may no longer be up-to-date. Before contacting the customers for win-back purposes, the updated contact information should be collected from the general customer data bases. It is, however, positive that customership can still remain

even if the customer terminates one product as customers may have several products from the same company.

4.2.6 360-Degree View of the Customer

One of the main objectives of an effective CRM strategy is to provide an enterprise-wide overall profile of a customer throughout all customer touchpoints. The company has strived to keep customer information coherent despite the separate CRM systems for different technologies. There used to be different customer service channels for mobile and broadband customers before the organizational change. The integration enabled better 360-degree view of the customers as the company started to pay attention to the customer-based strategy instead of the product-based strategy.

Currently the 360-degree view in the company comes in pieces as it is collected from different data systems. Agent's desktop, that many customer contact channels use, aims to collect this information and provide a complete single customer profile. Agent's desktop is used in customer service, technical customer service, delivery process, and sell operations. Delivery services find agent's desktop as the most comprehensive overview of the customer among all the systems. Agent's desktop provides basic information of the customer, reasons for contacting the company, current products, and products that are in the delivery process at the moment. Employees in the customer touchpoints are responsible for updating to the agent's desktop all the customer information that arises in the customer contact situations.

Although there are a variety of functionalities in the agent's desktop, more features are wished to the system based on the interviews. It would be useful to have more information about the geographical location of the customer, such as which technologies are possible to be delivered to the customer's address. This would be good in exceptional cases when the original ordered service cannot be delivered for some reason. Then, for instance, a delivery officer could easily see a list of replacing services that can be offered to the customer. Also marketing sees potential in adding selling recommendations and segmentation information to the agent's desktop. It would be a big advantage if the contact person in the customer touchpoint could see which products can be provided to a specific customer segment.

There are still operations required to make the agent's desktop visible, including all possible features, for all the users that need this interface. A more complete customer

profile could serve the customer service situation better. The challenge is that information is collected from many different systems, which complicates the agent's desktop development. A centralized CRM system could eliminate this problem.

It is important to see the customer as a whole also in the billing situation. When customer is in contact, it would be an advantage to see easily from the same interface how the products for individual customers are priced. At the moment the billing information needs to be checked from another system. It is necessary to see the overall picture of the customer in order to provide the most suitable products and services for the customer in a competitive manner.

There can easily be a conflict between limited licenses and a 360-degree view that should be provided across organizational boundaries. All information about the customer should not be visible to every employee using the agent's desktop and therefore the implementation of 360-degree view has to consider the limited licenses. Irrelevant information about the customer, in terms of the agent's role, should be excluded from the customer profile. It has to be thought carefully what information should be visible and to who.

4.3 Data Utilization Use Cases

4.3.1 Identifying Customer Needs

Customer data analyses are made to understand what customers want before the customers themselves even identify their needs. If it was, for example, known that a customer prefers one particular device to another, the company could then offer right products to this certain customer. Understanding the customer has many advantages especially when communicating with the customers whose contracts are about to expire. The customer can decide to continue the contract if a suitable service is offered to him or her at a critical moment.

The customer base in the company is modeled in order to know which customers would most probably be interested about a certain product. This customer scoring method means that customers are ranked so that the person that would most likely be interested about a product is ranked as number one, the second most interested as number two, and so on. Campaigns are not targeted to all customers, but to a group that most likely would buy the product, for instance, to the top 10 of the customer base. The

model is built by using all available information about a customer including basic information, purchase behavior classes, and transaction history.

Operators in general co-operate with service providers. A service provider produces content and an operator, in turn, delivers the content to the customer. Operator's right to see the customer's information is limited because customer is, in fact, the service provider's customer. As the operator only enables the customer communication, it cannot utilize the information, such as what kind of content customer has used the most. For instance, Netflix can make suggestions for the users based on recently watched programs, but operator does not have permission for that information.

4.3.2 Digital Marketing

Digital marketing increases the importance of customer information accuracy. In the digital market the data needs to be correct and of high quality, as there is no manual data correction phase available. When customer is doing online shopping, it should be possible to close the deal all at once without any errors.

Data utilization related to e-services has a lot of potential for companies who operate online as well. Many utilization possibilities relate to segmentation of customers in the company's website. A customer browsing in the website can be identified either when the customer is registered to the company's online portal, or in case of unregistered customer, the cookie history can be used for identification. Cookies help companies to determine the most important parts of the website by examining where visitors in the website usually navigate and how long they stay there. The company has permission to utilize information only from existing customer or those customers who have given consents for that. Currently the company's online portal makes suggestions about suitable products to the customers based on customer scoring. Targeted service providing could also be implemented so that a tag about the customer segmentation was added to the person on the website.

If a customer searches, for instance, with words "broadband termination" on the company's website, it is rather clear that customer no longer wants to stay with the company. One possible customer retention technique is to send targeted offers based on customer's browsing activity to the customer's browser. Too intrusive contact can, however, frighten the customer. Digitalization increases the amount of available data, but the utilization has to be done in a way the company is not following a certain

customer. Customer may want to withdraw the company's permission to collect information if the practices are too aggressive from the customer point-of-view.

4.3.3 Data Commercialization

Many interviewees saw a lot of potential in data commercialization. IT department is interested in the company's politics about data commercialization, as it is important for IT architecture and system development to know what kind information should be collected and to which information should be accessed in the near future. Currently the company makes co-operation with third parties who can offer benefits for selected customers from the company's customer base.

Some foreign operators sell their customer data forward, but the case operator is not involved in the commercialization business yet. The company could, however, think about different use cases for segmentation information. There are many possibilities to combine the existing information about the customer with the surrounding world. Operators could work as information brokers who collect information of their customers and sell it to other companies that use the data for marketing purposes. The customer information could be either raw or enriched. However, transferring data to another service provider about how customer navigates online may not be acceptable from the customer's point-of-view. The legal department sees that the best way to commercialize data is to anonymize it first.

The possibilities of commercialization are not fully exploited at the moment in the company. The focus is currently on the potential efficient internal data utilization cases. Moreover, the data quality needs to be improved first before any commercialization actions.

4.3.4 Process Development

Customer feedback is categorized and directed to those business processes the feedbacks are concerning. The feedbacks are then reviewed by a process responsible in each process. The aim is to deploy feedbacks in the processes and their development projects. Processes can make a business plan to see if the improvements in the process reduce the amount of negative feedbacks.

In the delivery process it is examined what type of cases cause problems in the customer channels, and what kind of issues need improvement. For example, there may

be some customer groups that should be treated differently than the other customers. Fixed-line telephony service customers are an example of a special group, who are contacted to ensure that their fixed-line service is changed to a mobile subscription. More utilization based on purchase behavior classes could be done to identify new user groups that need special treatment. The delivery services, however, claim that the classified data is difficult to access.

Market process also utilizes feedback for process development. Market process, for instance, changed its offer pricing based on customer feedback. There used to be different offering periods for a device and a plan in the same order, which was confusing for the customer. The offering periods were then changed to last for an equal time. Based on customer feedback, the company also needs to develop its marketing channels to arouse customer's interest more.

4.4 Privacy Concerns

Legislation gives frames to the customer information processing. This helps businesses to understand the limits of information utilization, such as what can be done and under what conditions. Finnish law, for instance, requires planning in advance for what purposes customer data will be used.

Privacy legislation in the organization is the most visible in the issues related to license management. It is ensured that employees have access only to that kind of customer information they need for their job duties. If the job changes, the manager has the responsibility to check that the access rights are up to date.

In principle the consent from the customer for data utilization is given in the service contract. There are also separate marketing actions where an additional consent is needed. The register descriptions are given to the customer in the sales situation and are also available on the Internet. It is defined in the register descriptions how and where the customer information can be utilized, and that customer information is operated in accordance with the law. Customer information can also be anonymized and utilized in that way. The company wishes to obtain consents for different issues, but the consents need to be balanced so that it is beneficial both for the customer and the company. For example, e-marketing requires a separate consent from the customer. The company has to improve its consent collecting strategies to achieve better business benefits.

Big data analyses for statistical purposes are permitted as long as the individual person is not recognized from the outcome of the analysis. It is allowed to form segment groups based on the collected data. Collection of individual information from different sources is forbidden without consent from the customer. Operators and authority are discussing about the stage when the information is anonymized and a person is no longer recognized.

The EU general data protection legislation is due to change in the next few years and there are factors companies should consider in order to ensure that IT systems and business processes are operating according to law. The amounts of fines might be increased considerably as well if rules are not followed. The company is making improvements to the systems and processes to ensure their operation in accordance with the future legislation.

4.5 Main Development Areas

The company collects and stores a lot of information but there are two main reasons, one internal and one external, why the data cannot be utilized efficiently. One obstacle for information utilization is the fragmentation of customer information. It would be possible to utilize customer information better if the systems were more agile and CRM processes smoother. Another limiting factor for data processing is the lack of permission to utilize all of the existing information. Development areas in this section are divided into improvement suggestions related to CRM and information utilization. The main points are summarized in tables 7 and 8 in the end of both sub-sections.

4.5.1 Improvements for CRM

The company has improved its customer understanding because of the transformation program and organizational changes in the last few years. Customer data masters for consumer and corporate customers were introduced about ten years ago. In addition, customer ID was a significant change that improved customer identification from different data systems. PET and commercial process in turn are good examples of more customer-oriented process thinking. However, almost all the interviewees stated that the CRM is not at a good level in the company.

Deviations in the data quality are mostly result of the several legacy systems that were not integrated with each other in the history. CRM system integration will

obviously facilitate the data processing. Systems need to operate in accordance with the law in order to maintain customers' privacy and avoid significant sanctions that are planned in the data protection regulation reform.

Interviews revealed that there is a need for a proactive continuous data correction process, as currently the correction is done in a reactive mode. Data governance in the company could be improved by forming a data governance council, consisting of an executive sponsor, project manager, business stakeholder, and data steward. These responsibilities could help to create organization-wide data management standards and ensure trusted data.

Company needs a customer lifecycle process in which the customership stages are defined both from the customer's and organization's perspectives. Some companies also have a customer manager, whose responsibilities include customer lifecycle strategy, and this type of solution could be utilized in the case company as well. Customer information is multi-dimensional and there should be clearer definitions about what customer information means to different stakeholders.

The interviews discovered that the agent's desktop, that came to use in the company a few years ago, has clearly improved the access to the 360-degree view of the customer. However, the interviewees hoped that some important features would still be added to the user interface. Suggestions of products based on personalization could be a good addition to the system. For instance, delivery officers could then easily know which products to offer in case the delivery of the original product fails for some reason. It would be practical that employees working with the agent's desktop could easily see the customer's place of residence, coverage areas, and products that can be delivered to the customer. These features would make it easier for employees to work with the user interface as the need to look for the information from various systems would reduce.

Despite the increasing amount of customer acquisition, retention, churn, and win-back actions in the company, there are still improvements required in the customer-firm relationship. Customer acquisition currently does not reach all of the adopter groups. The company should rethink its branding and marketing strategies to acquire the targeted customers. The market has changed its direction from product-centric to customer-centric approach. Therefore, churn could be prevented by comparing individual customer's products to the offering and find the most suitable solution for the customer also in terms of the pricing. More win-back actions for the left customers are

also needed in the company, but before the rescue it is important to first know what to offer to make the customers interested in the company again.

Table 7: Summary of CRM development ideas

⇒ Data governance roles: executive sponsor, project manager, business stakeholder, and data steward
⇒ Customer manager responsible for end-to-end customer lifecycle
⇒ Processes from both customer and organizational perspective
⇒ Definition of customer information concepts and models for different business processes
⇒ Improvements to the 360-degree view of the customer
⇒ Rethink of marketing channels and branding for customer acquisition
⇒ Concentration on customer-centered service solutions to prevent churn
⇒ More win-back actions

4.5.2 Improvements for Information Utilization

Privacy issues are a challenging aspect of customer data utilization. A separate consent may be needed for additional utilization possibilities. Customer's consent gives an opportunity to analyze the information in more detail and, thereby, provide extra value to the customer. The company must respect customer's privacy and pursue to utilize information anonymously as many ways as possible. Main utilization targets are digital personalization, marketing, customer service channels, process development, and commercialization.

There are many possibilities to utilize those customers' information who have given the consent for it and more targeted service can be provided to them. Customer data and browsing activity can be used to form predictive big data analytics that will provide smooth commerce experience for the customer in the website. Customers are more satisfied if they can easily find relevant information for them in the website and if they do not have to see content they are not interested in. Customer satisfaction will lead to customer loyalty and higher profitability.

Data can be utilized for marketing purposes. One research in the literature chapter described how some companies use location-based mobile applications to provide extra-

value for their customers at the same time collecting information about them for marketing purposes. Location-based analytics together with other technologies would help to better understand the customers and provide exceptional customer service. If it is detected from the customer's online behavior that the customer would like to terminate the service, suggestions about alternative services could show up in the customer's browser.

Well utilized data can also help customer service channels to perform more customer-oriented and provide better customer service experience. Customer channels could receive suggestions based on customer segmentation about which products to offer to those customers that contact the company. These suggestions could be visible for the employees in the customer communication situations. When customer contacts the company for terminating a service, more suitable product based on customer segmentation could be offered immediately to keep the customer. Moreover, new utilization options are needed for churned customers' information.

Customer information is currently utilized for process development by directing the feedbacks from customers to those business processes the feedbacks are concerning. Customer information could be utilized to identify more customer segments whose behavior differs significantly from the others and needs special treatment in the business processes. The delivery services have special practices for fixed-line telephony service customers, as they are a group who most likely are going to determine their services due to the decreasing success of fixed-line voice. These customers are contacted to ensure that they will receive a corresponding mobile service and will not leave the company. The information about purchase behavior classes should be easier available and utilized more for customer channels' purposes.

Data commercialization is not part of the case company's data handling. The company's policy focuses on different utilization cases for the company's own purposes rather than commercializing the data. The company co-operates with third parties who can target offers for operators' customers. Operators in general can sell raw or enriched data for other companies' purposes. Raw data can include phone numbers and e-mail lists and enriched data can consist of, for example, segmentation information of the customers. However, the quality has to be ensured before selling the data forward. Anonymous data commercialization is safer and from the customers' point-of-view also more acceptable option than commercializing individual customer's information.

Utilization cases should be evaluated carefully in advance. It is important to know at an early stage of the IT system development which features should be included to the IT systems, and what kind of information should be available. Moreover, Finnish law requires defining the data usage purposes in advance.

Table 8: Summary of ideas for better customer information utilization

⇒ Usage of big data analytics to provide suggestions about suitable products and excluding irrelevant content in the customer's browser
⇒ Contextual and location-based marketing
⇒ Suggestions to the customer channels about which products to offer based on customer segmentation
⇒ Identification of more customer classes that need special treatment
⇒ Utilization of anonymous data for marketing and commercial purposes
⇒ Identification of the data utilization cases well in advance

5 Conclusions

5.1 Discussion

The aim of the research was to find out what an efficient CRM requires from a company and what utilization cases for the collected data the CRM enables. The research was conducted as a qualitative analysis consisting of a literature review and an empirical research. The literature review was established to provide a conceptual framework for CRM and information utilization. The empirical research included a document analysis and semi-structured interviews, which were applied to construct an overview of the current situation in the company. In the document analysis, different sources from the organization's archives related to business processes, information systems, and privacy governance were reviewed. The interviewees were chosen from the company's employees to cover a wide range of knowledge related to CRM and information utilization issues. The interviewees were Department Manager of Information Management, Department Manager of Delivery Services, Privacy Officer / Senior Legal Counsel, Head of Consumer Offering, Head of Customer Insight and Analysis, and Head of IT Architecture. Interviews were analyzed by a meaning condensation method that classified the interview topics into four main categories: CRM, data quality, data utilization, and privacy. Collection of the information from the interviews was relatively easy as all the interviewees were interested about the topic and were likely to share their experiences and views. The summarized answers to the research questions are given next.

Q1. What does an efficient customer relationship management require from a company?

CRM is a customer-centered strategy which aims to improve profitability, efficiency, and customer satisfaction. CRM process collects information about customers, market trends, and marketing effectiveness, which can be implemented into the decision-making process of a company.

The four goals of an effective CRM strategy and, at the same time, the lifecycle stages of the customer-firm relationship are customer acquisition, retention, churn, and win-back. The acquisition and retention processes should be viewed together by

measuring the customer value and monitoring customers' purchasing and attitudinal behavior. Marketing channels and branding need to be reviewed carefully in order to target those customers defined in the business plan. Churn prevention can be made more efficient by providing customer-centered service solutions for each individual customer. In the win-back process, it is crucial to consider the right time and suitable offering for the win-back actions.

Database, technology, and metrics need to be examined when implementing CRM strategy. Telecom operators have usually relatively wide database as they collect a lot of information about their customers. Database analyses can teach the marketers what is done right and what should be improved. CRM data systems should be centralized to maintain the data quality and standards in the company. Privacy issues are also easier to take into account in a centralized system. Brand-level and customer-level metrics are utilized for CRM activities by different measurements, such as customer values and revenue changes.

CRM should not be viewed only as technology software, but as multi-layered CRM strategy focusing also on processes, people, and culture. A CRM project team helps to involve people in taking responsibilities, increase staff motivation, and adopt the new CRM strategy. The business processes must serve the individual customers in terms of their needs and values. The culture change in the organization is essential for smooth organization-wide information sharing and effective communication.

The importance of customer engagement in the social networks has increased during the past few years. Companies have seen an advantage in broadening their CRM into SCRM, where customer relationships are maintained and improved through social media. Customer feedback collected by different VoC tools can be implemented in business development to improve customer satisfaction, retention, and revenue growth.

Data governance with data quality and data standards is an important part of CRM implementation. Data governance includes all processes, roles, and responsibilities of data management. The four roles of data governance council are executive sponsor, project manager, business stakeholder, and data steward. The customer lifecycle process, where the stages of customer lifecycle are clearly defined, should be part of the main business processes. Companies also need a customer manager responsible for the customer lifecycle strategy. Organizations must improve their data quality continuously by measuring and monitoring the data. Data standards define how data should be created, presented, transformed, and conformed. Data standardization ensures the

efficient usage of data by defining the representation of data concepts and preventing inconsistencies in the data. It would be useful to have and information map with clear definitions about what customer information means to different stakeholders, such as to different business processes.

The research revealed that the CRM strategy in the case company has evolved greatly during the past few years. This is largely due to the change from technology-centered to customer-centered business strategy. The actions included centralization of mobility and broadband services into the same business areas; data quality projects correcting the customer and network information; and renewing business processes and IT architecture, such as by introducing customer ID and customer data master systems. The main development areas needed for the CRM in the company are clearer definitions for customer information, a customer manager responsible for customer lifecycle, and a continuous data correction process.

Q2. How could customer information be utilized to obtain better business benefits?

Digitalization and new technologies have enabled new sources of information and possibilities to generate and collect massive amounts of data. Customer segmentation with predictive and prescriptive analytics can provide better customer understanding, personalized services, and targeted marketing campaigns. This study found five main utilization cases for the collected data: digital personalization, marketing, customer service channels, process development, and commercialization.

One internal and one external factor that cause challenges for the customer information utilization were identified in the research. The internal limitation is the quality problems in the information due to the complexity of the data systems and business processes. The external factor is related to the privacy and information utilization consents that limit the data processing.

Service operators collect vast amounts of information from their customers, such as basic customer information, billing data, network data, and social media data. The utilization cases for all the collected data are not always clear in organizations. The legislation regulates retaining and utilization of data. Mobile network operators must retain certain network data from six months to two years. The use cases for data utilization must be planned in advance and data shall be destroyed or archived when it is no longer necessary for the operations. Personal data can be used for marketing

purposes only with the customer's consent. Anonymization, however, increases the number of possible data utilization use cases. Personal data can be processed for research and statistical purposes if individuals cannot be identified from the result.

Information can be used to identify customer needs better. A customer in the website can be identified either by the registration information in the online portal, or from the cookie information. An operator does not have a permission to utilize the information of an unregistered customer other than anonymously. Moreover, content providers have a vantage over operators to utilize the information about the content used by a customer. Operators enable the delivery of the content but are not allowed to utilize this information from the network.

Data should be utilized to internal purposes as much as possible to provide an organization-wide 360-degree view of the customer. Employees working in the customer channel would benefit from the segmentation information about the customer. It would be useful for the employees to see what kinds of products are suitable and possible to deliver to a particular customer. This would increase both customer satisfaction and business processes efficiency.

It is essential for the IT to know well in advance for which purposes the data is going to be utilized. IT can then develop an access to the needed information in the data systems. New kinds of technologies are required for big data analyses and utilization of the results in the business decision making. However, data quality needs to be ensured before any utilization actions are implemented.

5.2 Findings

This section compiles the most important actions the organizations need to consider to efficiently utilize their customer information as a part of their CRM strategy.

- *Review the business processes.* The core business processes should be rebuilt from a customer perspective. There should be one customer process that covers the whole customer lifecycle. Alternatively, customer perspective must be applied in each business process.
- *Evaluate the necessary technology solutions.* When implementing a CRM strategy, companies should consider which IT systems are essential for the CRM solution and which are the limitations of the systems.

- *Define the roles and responsibilities for CRM.* The definition of clear CRM roles and responsibilities in the organization is essential for an efficient CRM strategy. A CRM project team and a customer manager responsible for the customer lifecycle process are necessary for ensuring the customer-centered approach and successful CRM implementation.
- *Provide a 360-degree view of the customer.* Every customer should be seen as a whole throughout the entire organization. All necessary information about a customer should be visible to the employees working in the customer channels to provide an excellent customer experience. Additional features in the agent's desktop can include suggestions about the most suitable products based on segmentation data and coverage information in order to know which products can be offered to a particular customer.
- *Define the data standards.* Definition of the most important concepts related to customer information in each business process maintains the consistent representation of data and ensures an efficient data processing.
- *Manage customer knowledge*. Customer knowledge should be applied to the decision-making process of a company to increase customer value. For example, customer acquisition can be improved by renewal of marketing channels and branding.
- *Analyze the customer information.* It is important to analyze the customer base for targeted offers and other customer-centered service solutions. Analyses help to identify the possible customer groups for marketing campaigns, and to find new ways for treating special customer groups to gain better business benefits. It is also important to regularly target campaigns for churned customers for win-back purposes.
- *Look for possibilities for contextual marketing.* Privacy policy must be considered before big data analytics implementation. Organizations can benefit from competitor analyses and gain understanding about the actions related to location-based marketing activities done, for example, in foreign companies.
- *Find responsible data utilization cases*. Companies should maintain customers' privacy in all of their data utilization cases and utilize preferably anonymized customer information.

5.3 Limitations and Directions for Future Research

The main limitations of the research are connected to generalizability issues. The case study was conducted in only one company from one industry. Insufficient resources, including time, were limiting factors for qualitative data collection. Six employees are not necessarily enough to create a perception of the whole company's situation. Moreover, due to the rescheduling one interview had to be conducted in less time than the others.

Future research could be conducted after the proposed CRM developments have been implemented in the company. Possible research objectives could include how the development ideas concretely impact the company's business performance. It would be interesting to see the effects of the process changes on the business performance. The future research would be useful when applying the new approaches in practice.

It is also necessary to estimate the costs of the both CRM and information utilization development suggestions before their implementation. The business case estimate could include implementation costs and evaluation about at which extent the new technologies would bring profit to the company.

The changes in the EU general data protection legislation are an important future research subject as well. The possible research could explore what companies need to consider related to the legislation reform and how it effects in the business performance. It is important to examine whether the new legislation regulates the anonymization more than the current one as after anonymization the data is more freely usable.

References

Bernard, H.R. 2011. Research Methods in Anthropology. 5th ed. AltaMira, Blue Ridge Summit. PA, USA. ISBN: 978-0759112421.

Bowen, G.A. 2009. Document Analysis as a Qualitative Research Method. Qualitative Research Journal. Vol. 9:2. pp. 27-40. DOI:10.3316/QRJ0902027.

Chen, I.J. & Popovich, K. 2003. Understanding Customer Relationship Management (CRM). Business Process Management Journal. Vol. 9:5. pp. 592-602. DOI:10.1108/14637150310496703.

Clemons, E.K., Wilson, J. & Fujie, J. 2014. Investigations into Consumers Preferences Concerning Privacy: An Initial Step towards the Development of Modern and Consistent Privacy Protections around the Globe. 47th Hawaii International Conference on System Sciences (HICSS). pp. 4083-4092. ISSN: 1463-7154. DOI:10.1109/HICSS.2014.504.

Corbin, J. & Strauss, A. 2008. Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory. 3rd ed. SAGE Publications. Inc. Thousand Oaks, CA. ISBN:9781452230153.

Davies, J. & O'Kane, B. 2013. Best Practices for Managing Master Data Management and Voice of the Customer. Gartner. [9 Jan 2015].

European Commission. 2014. Progress on EU Data Protection Reform Now Irreversible Following European Parliament vote. Press Release Database. Strasbourg.

European Parliament and the Council. 2006. Directive 2006/24/EC on the Retention of Data Generated or Processed in Connection with the Provision of Publicly Available Electronic Communications Services or of Public Communications Networks and Amending Directive 2002/58/EC.

Feiler, K., Fuest, K. & Steiner, M. 2011. What Customers Really Want: A Customer-Centric Strategy for Telecom Operators. Roland Berger Strategy Consultants. Available: www.rolandberger.com. [17 Dec 2014].

Finnegan, D.J. & Currie, W.L. 2010. A Multi-Layered Approach to CRM Implementation: An Integration Perspective. European Management Journal. Vol. 28:2. pp. 153-167.

Finnish Standards Association SFS. 2009. SFS-ISO/IEC 27000: Information Technology -- Security Techniques -- Information Security Management Systems -- Overview and Vocabulary. Helsinki.

Friedman, T. & Smith, M. 2011. Measuring the Business Value of Data Quality. Gartner. [24 Apr 2015].

Gantz, J. & Reinsel, D. 2012. The Digital Universe in 2020: Big Data, Bigger Digital Shadows, and Biggest Growth in the Far East. IDC iView: IDC Analyze the Future. Vol. 2007. pp. 1-16. Available: https://www.emc-technology.com/collateral/analyst-reports/idc-the-digital-universe-in-2020.pdf. [1 Apr 2015].

Graham, C. 2012. Anonymisation: Managing Data Protection Risk Code of Practice. Information Commissioner's Office. Available: https://ico.org.uk/media/1061/anonymisation-code.pdf. [25 Apr 2015].

GSMA Intelligence. 2015. Current Year-End Data Except Interpolated Subscribers and Connections. Available: https://gsmaintelligence.com/. [10 May 2015].

Hewlett-Packard Development Company. L.P. 2014. HAVEn: Everything You Need to Profit from Big Data at the Speed of Business. Available: http://www.autonomy.com/technology/haven/. [9 Jan 2015].

Hurwitz, J., Halper, F. & Kaufman, M. 2013. Big Data For Dummies. John Wiley & Sons, Incorporated, Somerset. NJ, USA. ISBN:978-1-118-50422-2.

Kelly, J. 2013. The Dual Role of Mobile Devices for Big Data. Wikibon. Available: http://wikibon.org/blog/the-dual-role-of-mobile-devices-for-big-data/. [16 Apr 2015].

Kotler, P., Keller, K., Brady, M., Goodman, M. & Hansen, T. 2009. Marketing Management. European ed. Pearson Education, GB. ISBN:9781282645417.

Kroll, K. 2013. Catching and Managing New Data. Compliance Week. Vol. 10:110. pp. 54-55.

Kumar, V. & Petersen, A. 2012. Statistical Methods in Customer Relationship Management. John Wiley & Sons. Somerset, NJ, USA. ISBN:978-1-119-99320-9.

Kurczewski, N. 2011. Tata Nano Seeks Footing as World's Cheapest Car. Edmunds Auto Observer. Available: http://www.edmunds.com/autoobserver-archive/2011/02/tata-nano-seeks-footing-as-worlds-cheapest-car.html. [5 Mar 2015].

Kvale, S. 2007. Doing Interviews. SAGE Publications. Ltd. London, England. DOI:10.4135/9781849208963.

Lakhina, A. 2013. Big Data Equals Big Change (in Revenue Models). Innovation Insights. Available: http://insights.wired.com/profiles/blogs/in-

telecommunications-big-data-big-change-in-revenue-models#axzz3WoT9t3CW. [9 Apr 2015].

Linden, G., Smith, B. & York, J. 2003. Amazon.com Recommendations: Item-to-Item Collaborative Filtering. IEEE Journals & Magazines. Vol. 7:1. pp. 76-80. DOI:10.1109/MIC.2003.1167344.

Maoz, M. & Sussin, J. 2014. Hype Cycle for CRM Customer Service and Customer Engagement. Gartner. [11 Dec 2015].

McAfee, A. & Brynjolfsson, E. 2012. Big Data: The Management Revolution. Harvard Business Review. Vol. 90:10. pp. 60-68.

McMillan, R. 2014. Verizon's 'Perma-Cookie' Is a Privacy-Killing Machine. Wired. Available: http://www.wired.com/2014/10/verizons-perma-cookie/. [9 Apr 2015].

Ministry of Justice. 2015. Personal Data Act (22.4.1999/523). Finland.

Narayanan, A. & Shmatikov, V. 2008. Robust De-Anonymization of Large Sparse Datasets. IEEE Symposium on Security and Privacy. pp. 111-125. DOI:10.1109/SP.2008.33.

Rau, K.G. 2004. Effective Governance of It: Design Objectives, Roles, and Relationships. Information Systems Management. Vol: 21:4. pp. 35-42. DOI: 10.1201/1078/44705.21.4.20040901/84185.4.

Roebuck, K. 2011. Data Quality: High-Impact Strategies - What You Need to Know: Definitions, Adoptions, Impact, Benefits, Maturity, Vendors. Emereo Pty Limited. ISBN:9781743046319.

Rogers, E.M. 2010. Diffusion of Innovations. 4th ed. Simon and Schuster. ISBN:9781451602470.

Rohling, G. 2014. Facts and Forecasts: The Economic Impact of Digital Expansion. Pictures of the Future. Available: http://www.siemens.com/innovation/en/home/pictures-of-the-future/digitalization-and-software/from-big-data-to-smart-data-facts-and-forecasts.html. [2 Apr 2015].

Sarsfield, S. 2009. Data Governance Imperative. IT Governance. Cambs, GBR. ISBN:978-1849280129.

Satmetrix Net Promoter Community 2015. The Net Promoter Score and System. Available: http://www.netpromoter.com/why-net-promoter/know. [24 Mar 2015].

Sebastian-Coleman, L. 2013. Measuring Data Quality for Ongoing Improvement: A Data Quality Assessment Framework. Elsevier. ISBN:978-0-12-397033-6.

Sengar, P., Thompson, E., Collins, K., Davies, J., Fletcher, C., Sussin, J., Gillespie, P., Manusama, B., Kohler, D. & Sood, B. 2014. Tap Into CRM Use Cases for Big Data and Analytics to Drive Customer Engagement. Gartner. [12 Jan 2015].

Sussin, J. 2014. CRM Key Initiative Overview. Gartner. [22 Jan 2015].

Tallon, P.P. 2013. Corporate Governance of Big Data: Perspectives on Value, Risk, and Cost. Computer. Vol. 46:6. pp. 32-38. DOI:10.1109/MC.2013.155.

Thompson, E. 2014. The Eight Building Blocks of CRM: Overview. Gartner. [5 Apr 2015].

TNS MediaMap 2012. TNS Atlas esittely. Available: http://www.tns-gallup.fi/mediamap/#0. [9 Apr 2015].

United States Department of Justice 2006. Privacy Technology Focus Group: Final Report and Recommendations, Global Justice Information Sharing Initiative. Washington, DC. Available: https://it.ojp.gov/documents/privacy_technology_focus_group_full_report.pdf. [25 Apr 2015].

Verhoef, P.C., Reinartz, W.J. & Krafft, M. 2010. Customer Engagement as a New Perspective in Customer Management. Journal of Service Research. Vol. 13:3. pp. 247-252. DOI:10.1177/1094670510375461.

Watson, H.J. 2014. Addressing the Privacy Issues of Big Data. Business Intelligence Journal. Vol. 19:2. pp. 4-7. ISSN:1547-2825.

Weber, K., Otto, B. & Österle, H. 2009. One Size Does Not Fit All---A Contingency Approach to Data Governance. ACM Journal of Data and Information Quality. Vol. 1:1. pp. 1-27. DOI:10.1145/1515693.1515696.

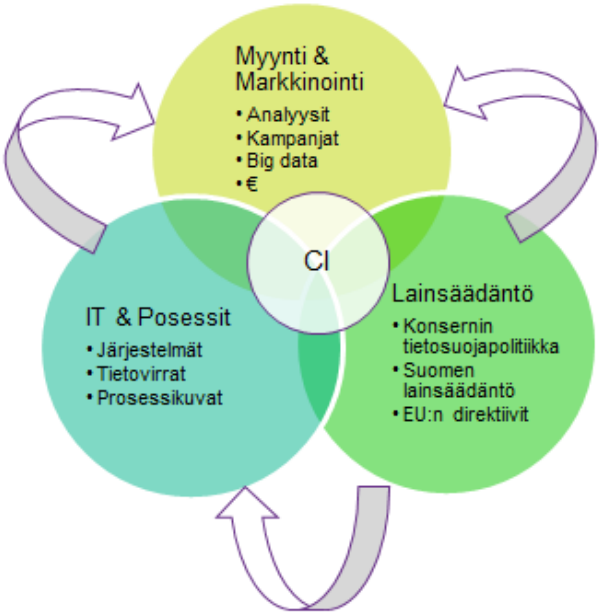
Winer, R.S. 2001. A Framework for Customer Relationship Management. California Management Review. Vol. 43:4. pp. 89-105.

Zhou, B., Pei, J. & Luk, W. 2008. A Brief Survey on Anonymization Techniques for Privacy Preserving Publishing of Social Network Data. ACM SIGKDD Explorations Newsletter. Vol. 10:2. pp. 12-22. DOI:10.1145/1540276.1540279.

Appendix A: Interview Invitations in Finnish

Teen diplomityötäni liittyen asiakastiedon hyödyntämiseen yrityksessä ja haluaisin haastatella Sinua työtäni varten. Sopiiko ehdottamani haastatteluaika Sinulle? Voit tutustua etukäteen haastattelun aihepiiriin sekä haastattelukysymyksiin:

Asiakastiedon käsittelyyn liittyy kolme isompaa kokonaisuutta, joita ovat IT ja prosessit, myynti ja markkinointi, sekä lainsäädäntö. Näiden suhteet on havainnollistettu alla olevassa kuvassa, jossa asiakastieto (Customer Information, CI) on keskiössä. Järjestelmät, tietovirrat ja prosessikuvaukset ovat asiakastiedon prosessoinnin työkaluja, joiden avulla IT ja prosessit antavat myynnille ja markkinoinnille valmiudet analysoida asiakastietoa. Tekemällä big data -analyysejä voidaan segmentoida asiakkaita ja kohdistaa markkinointi ja kampanjat oikeille asiakkaille, ja sillä tukea yrityksen liiketoimintaa. Konsernin tietosuojapolitiikka, Suomen lainsäädäntö, sekä EU:n direktiivit määrittelevät asiakastietojen käsittelyyn liittyvät periaatteet. Lainsäädäntö puolestaan säätelee IT:n ja prosessien, sekä myynnin ja markkinoinnin oikeutta käsitellä asiakastietoja.



Asiakastieto hajoaa helposti eri järjestelmiin eri muodoissa, mikä hankaloittaa tiedon hallittua käsittelyä. Myös asiakaspalautetta tulee useista eri kanavista, kuten puheluiden, sähköpostin, blogien ja sosiaalisen median kautta. Asiakkuudenhallinnan

(Customer Relationship Management, CRM) strategian tavoitteena on (1) saada tuottavia asiakkaita, (2) pitää tuottavat asiakkaat, (3) estää asiakkaita siirtymästä kilpailijalle ja (4) saada jo lähteneet asiakkaat takaisin. CRM:n tarkoituksena on helpottaa yrityksen sisäistä tiedonjakoa ja antaa 360-näkymä asiakkaasta koko yrityksen käyttöön. Teknisen toteutuksen lisäksi CRM-strategian toteutuksessa tulee ottaa huomioon koko organisaatio: sen kulttuuri, prosessit ja ihmiset. CRM:llä tulisi olla myös projektipäällikkö ja kehitystiimi.

Big data tarkoittaa suurta määrää tietoa, jota yritykset tuottavat, säilövät ja hallitsevat. Big datan avulla voidaan personoida asiakkaita sekä tarjota parempaa asiakaspalvelua ja siten parantaa liiketoimintaa. Kohdennetun markkinoinnin hyötyjen ja asiakkaan toivoman yksityisyyden välinen raja on kuitenkin häilyvä. Lisäksi suuren datamäärän suojattu käsittely on haasteellista sen tapahtuessa usean ihmisen toimesta.

Appendix B: Interview Dates and Questions in Finnish

Department Manager, Information Management, 24.3.2015

1. Miten merkittävää asiakastieto on mielestäsi yrityksen toiminnalle ja menestykselle? Miksi?
2. Onko yrityksessä määritelty asiakkuudenhallinnan strategiaa (CRM)? Jos ei, niin miksi?
3. Hyödynnetäänkö asiakastietoa tarpeeksi?
4. Miten asiakastietoa voisi hyödyntää niin, että se edistäisi yrityksen liiketoimintaa?
5. Miten asiakastietoa ja sen oikeellisuutta ylläpidetään?
6. Ovatko tämänhetkiset liiketoimintaprosessit riittäviä (Product, Market, Sell, Deliver&Install, Service&Support, Bill, Service Assurance)?

Department Manager, Delivery Services, 25.3.2015

1. Miten asiakastietoa käytetään toimitusprosessissa?
2. Miten asiakastietoa voisi hyödyntää vielä paremmin toimittamisessa?
3. Onko yrityksessä toimiva asiakkuudenhallinta? Miten se näkyy toimitusprosessissa?
4. Mitä vaatimuksia tai rajoituksia teknologia asettaa toimitusprosessille?
5. Onko toimituksella aina kaikki tarpeellinen asiakastieto saatavilla?

Privacy Officer / Senior Legal Counsel, 26.3.2015

1. Miten merkittävää asiakastieto on mielestäsi yrityksen toiminnalle ja menestykselle? Miksi?
2. Hyödynnetäänkö asiakastietoa tarpeeksi yrityksessä?
3. Miten asiakastietoa voisi hyödyntää niin, että se edistäisi yrityksen liiketoimintaa?
4. Onko yrityksessä määritelty asiakkuudenhallinnan strategiaa (CRM)? Jos ei, niin miksi?
5. Tuoko digitalisaatio ja elektroninen markkinointi haasteita asiakastiedon laadulle ja käytölle?
6. Miten lainsäädäntö tukee asiakastiedon hallintaa? Entä mitä rajoituksia se asettaa? Haluttaisiinko tehdä jotakin enemmän?

7. Mitä näkemyksiä sinulla on säätelystä big dataan liittyen? Onko big data este vai mahdollistaja?
8. Miten Privacy-lainsäädäntö otetaan huomioon yhtiön asiakastiedossa?
9. Ovatko tämänhetkiset liiketoimintaprosessit riittäviä (Product, Market, Sell, Deliver&Install, Service&Support, Bill, Service Assurance)?

Head of Consumer Offering, 1.4.2015

1. Miten asiakastietoa käytetään markkinointiprosessissa?
2. Miten big dataa hyödynnetään markkinoinnissa? Miten sitä käytetään esim. New Sales (uudet), Upsales (nykyiset) ja Churn (lähtevät asiakkaat) –prosesseissa?
3. Tuoko digitalisaatio ja elektroninen markkinointi haasteita asiakastiedon laadulle ja käytölle?
4. Onko yrityksessä toimiva asiakkuudenhallinta? Miksi tai miksi ei? Miten se näkyy markkinointiprosessissa?
5. Mitä vaatimuksia tai rajoituksia teknologia asettaa markkinointiprosessille?
6. Miten lainsäädäntö rajoittaa asiakastiedon käyttöä markkinoinnissa?

Head of Customer Insight and Analysis, 1.4.2015

1. Miten merkittävää asiakastieto on mielestäsi yrityksen toiminnalle ja menestykselle? Miksi?
2. Hyödynnetäänkö asiakastietoa tarpeeksi yrityksessä?
3. Miten asiakastietoa voisi hyödyntää niin, että se edistäisi yrityksen liiketoimintaa?
4. Onko yrityksessä määritelty asiakkuudenhallinnan strategiaa (CRM)? Jos ei, niin miksi?
5. Tuoko digitalisaatio ja elektroninen markkinointi haasteita asiakastiedon laadulle ja käytölle?
6. Onko yrityksessä Voice of the Customer (VoC) –toimintaa, missä asiakaskokemusta hallitaan kerätyn asiakaspalautteen avulla? Miten se näkyy asiakassuhteessa ja asiakastiedon käytössä?
7. Miten asiakastietoa hallitaan ja miten sillä johdetaan?
8. Ovatko tämänhetkiset liiketoimintaprosessit riittäviä (Product, Market, Sell, Deliver&Install, Service&Support, Bill, Service Assurance)?

Head of IT Architecture, 1.4.2015

1. Miten asiakastieto huomioidaan CRM-järjestelmissä? Onko asiakastieto ajan tasalla jo silloin, kun CRM-järjestelmä otetaan käyttöön?
2. Tekeekö IT yhteistyötä markkinoinnin kanssa? Miten se näkyy CRM-järjestelmien hankinnassa?
3. Suojellaanko asiakastietoa IT-järjestelmien toimesta? Miten?
4. Miten kokonaisarkkitehtuuri tukee liiketoiminnan tavoitteita tällä hetkellä? Entä miten jatkossa? Näkyykö esim. big data -asiat tarpeina arkkitehtuurin puolella?

Appendix C: Meaning Condensation of the Interviews

	Positive	Negative	Development ideas	Category
1	Data quality in general is good	Reactive data correction Need to update data to many systems	Improving product-specific sales Meters that monitor data synchronization Data updating by customers	Data quality
	Anonymous utilization possible	Utilization not fast enough	Linking companies together for data commercialization	Data utilization
	360-degree view is improved in the transformation program	360-degree view is fragmented and built on top of the legacy systems CRM understood only as a technical system	CRM processes from both customer and organizational perspectives Defining concepts and models of customer information for processes	CRM
		Additional consents are needed in areas which are not covered by the agreement		Privacy
2	Customer contact information is wider and better available	Incorrect / not updated information Delivery quality is not always the best possible because of an incorrect information Marketing campaigns are not optimally targeted		Data quality
	Process development	Special treatment of different customer segments requires more resources from the organization	Identifying more special groups Utilization based on purchase behavior classes	Data utilization
	Churn: offering another product instead if delivery is not possible Retention: offering different technologies	Need to check information from many systems Not all information available	More information about the customer to the agent's desktop A better view of the potential offering	CRM
3			Manager responsible for customer information accuracy	Data quality
	A lot of ideas for utilization Analyzing big data for statistical purposes Focusing on customer experience	Systems and processes should be more agile Customers do not feel like benefiting from marketing consent Customer feels like losing his or her privacy	Possibilities in data commercialization Balancing the benefit of consent collecting for customer and business Identifying unregistered customers Offering a service before the customers themselves identify their needs	Data utilization
		One company appeared to the customer as multiple companies (e.g. several bills)	Party responsible for end-to-end customer lifecycle Customer lifecycle process Process to the end of the customer lifecycle	CRM
	Privacy legislation gives frames to the data collecting Internal project ensuring that systems are in accordance with the law	Differing views of anonymity between authority and operator Data protection legislation reform is very detailed		Privacy
4		Incorrect addresses related to some product areas Analyses are slow due to the fragmented information		Data quality
	Customer feedback used for process development	Number of IT system create complicity and also effecting on marketing campaign releases Churn prevention is difficult if customer has a telemarketing ban	Customer activations and online raffles to obtain consents Information about in which channels customers visit Suggestions of products based on personalization to the	Data utilization

			agent's desktop More concentration benefits Higher amount of e-marketing consents would enable better customer-specific contacting Customized marketing campaigns for different channels	
	Customership can stay even if customer terminates one service Churn: contacting customers who have expiring offers Win-back	Customer base should be broaden to cover more adopter groups Sometimes customer information is not available, e.g. users in housing companies	More win-back operations Finding the most suitable solution for an individual customer in terms of the pricing Targeted campaigns	CRM
5	One database for campaign data Data governance has been improved	Many integrations between data systems cause complications The agent's desktop does not include marketing activities		Data quality
	Co-operation with third parties: anonymous data used for providing company offers to the customers Collecting customer feedback: NPS and customer effort surveys Feedback used for process development Customer scoring Enriching customer data by information from external sources Customer Insight & Analysis - unit founded for data utilization		Data should be of good quality before commercializing it Development of third party co-operation	Data utilization
	Strategy is based highly on customer experience and understanding PET and commercial processes			CRM
		Network data can be utilized only anonymously		Privacy
6	Combining CRM-systems	Need to open many systems to view customer information Individual access instead of role based access in the legacy systems Data privacy actions require improvements in the legacy systems Data quality problems caused by manual work	New tools and systems for big data processing Supporting the testing of fast business ideas and new innovations	Data quality
	Increased co-operation with the marketing	No clear vision what kind of customer information is needed	Utilize data for commercialization purposes	Data utilization
	Retention and purge legislation easy to implement in the new systems			Privacy

1. Department Manager, Information Management
2. Department Manager, Delivery Services
3. Privacy Officer / Senior Legal Counsel
4. Head of Consumer Offering
5. Head of Customer Insight and Analysis
6. Head of IT Architecture